

## REVISION OF THE ADERIDAE OF EASTERN NORTH AMERICA

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*Abstract.*—The family now contains 37 species in this region, including *Aderus populneus* (Panzer), apparently introduced from Europe. One new genus, *Gymnoganasculus* (type-species *G. stephani*) is described. New generic synonymy is *Aderus* Westwood (= *Phomalus* Casey), *Ariotus* Casey (= *Scanylus* Casey), and *Ganascus* Casey (= *Sandytes* Casey).

New species described are *Elonus hesperus* (Oklahoma, Missouri, Arizona), *Gymnoganasculus stephani* (Oklahoma, Texas, Kentucky, Mexico, Cuba), *Vanonus balteatus* (Oklahoma, Texas, Kansas), *V. macrops* (Missouri), *V. musculus* (Oklahoma), *V. oklahomensis* (Oklahoma), *V. uniformis* (Florida to Arkansas), *V. valgus* (Oklahoma to Florida), *Zonantes floridanus* (Florida), *Z. mississippiensis* (Mississippi), *Z. ouachitanus* (Oklahoma), and *Z. pallidus* (Oklahoma to Florida and eastern Canada). New combinations are *Aderus brunnipennis* (LeConte), *A. saginatus* (Casey), *A. tantillus* (Champion), *Ariotus luteolus* (Casey), and *Ganascus ptinoides* (Schwarz). New specific synonymy is *Pseudariotus notatus* (LeConte) (= *Pseudariotus amicus* Casey), *Elonus basalis* (LeConte) (= *Elonus princeps* Casey), *Emelinus melsheimeri* (LeConte) (= *Emelinus ashmeadi* Casey), *Ganascus ventricosus* (LeConte) (= *Ganascus opimus* Casey, *G. palliatus* Casey), *Vanonus huronicus* Casey (= *Tanilotes densus* Casey), *Vanonus piceus* (LeConte) (= *Xilophilus tuberculifer* Hamilton, *Vanonus congener* Casey, *V. fusciceps* Casey), *Vanonus sagax* Casey (= *V. floridanus* Casey), *Zonantes fasciatus* (Melsheimer) (= *Z. tricuspis* Casey), and *Zonantes hubbardi* (Casey) (= *Z. schwarzi* Casey).

Type-species are designated for the Casey genera *Ariotus*, *Elonus*, *Emelinus*, *Ganascus*, *Phomalus*, *Pseudariotus*, *Tanilotes*, *Vanonus*, and *Zonantes*. Lectotypes are selected for *Axylophilus yuccae* Casey; *Euglenes signatus* Haldeman; *Ganascus palliatus* Casey; *Xilophilus tuberculifer* Hamilton; *Xylophilus brunnipennis* LeConte, *X. fasciatus* LeConte, *X. impressus* LeConte, *X. melsheimeri* LeConte, *X. nebulosus* LeConte, *X. piceus* LeConte, *X. ptinoides* Schwarz, *X. quercicola* Schwarz, *X. subfasciatus* LeConte, and *X. ventricosus* LeConte; and *Zonantes tricuspis* Casey.

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The author has had an interest in the beetle family Aderidae for some years, but this study was started when Karl Stephan requested identification of the aderids that he had collected on his property and in surrounding areas in Latimer County, eastern Oklahoma. He had taken most of the species known from the eastern United States, and series with both sexes of a number of species known from single specimens. His findings on season of emergence, relative abundance and habitat preference, the result of two full seasons of intensive collecting, will be the subject of a separate joint paper. The present contribution is based on his collection and on specimens generously loaned by the curators of museums and the private collectors listed in the acknowledgments.

The region covered, North America east of the 100th Meridian, is essentially what has been treated by previous authors, most notably LeConte (1855) and Casey (1895, 1905). The few species described from the Southwest (Casey, 1895; Werner, 1956)

and southern California (Casey, 1895; Fall, 1901) are part of a largely undescribed fauna that may serve as the subject of another study. There seems to be little overlap between the regions; only one species of *Emelinus*, one of *Elonus*, and the introduced *Aderus populneus* have been taken both east and west of the 100th Meridian.

The size of individual species is given as length of a representative specimen from front of head with head deflexed to tip of elytra, width across widest part, and length of elytra. The range of size is given in terms of variation in the length of the elytra, a more reliable measurement than total length, which is influenced by the position of head and prothorax.

CLASSIFICATION

The family is more familiar to American workers as Euglenidae, but Baguena (1948) has argued that it should be Aderidae, and Mroczowski and Slipinski (1987) have petitioned the International Commission on Zoological Nomenclature to use its plenary powers to place Aderidae on the Official List of Family-Group Names in Zoology (Case 2510) and place Euglenesidae (=Euglenidae Seidlitz) in synonymy.

Casey (1895) placed the Nearctic species in 13 genera, Champion's genus *Cnopus* (1893) and 12 that he described as new. He later (1905) synonymized one genus, *Tanilotes*, on finding that it was based on females that could be associated with males in his genus *Vanonus*. Champion (1890, 1893) had described 44 species in the *Biologia Centrali-Americana*, placing all but the one species of *Cnopus* in the genus *Xylophilus*. Maurice Pic (1905) reduced all of Casey's genera to subgenera of *Hylophilus*, and assigned additional species in Central and South America to some of them on the basis of Casey's descriptions.

By far the most detailed study of any aderid fauna is that of Baguena for tropical Africa, reported in two publications (1948, 1962). In the first paper Baguena attempted to build a classification to include all of the previously described genera, and placed some of Casey's genera into synonymy with others from other regions. His treatment of the Nearctic fauna suffered from a severe lack of specimens, so he could place most of Casey's genera only on the basis of the original descriptions. Two of the major divisions of Baguena's classification are based on the presence or absence of interstitial setae between the primary setae that arise from major punctures. Israelson (1971) has called attention to the fact that the interstitial setae can be present or absent within a single species of *Vanonus*.

The classification presented here is an attempt to regroup the Nearctic genera on the basis of characteristics of the male genitalia as well as the more easily observed external characters. It has been possible to examine the male genitalia of almost all the species. Two very distinct types are represented, one in which there is a pair of parameres on the sides of the tegmen, and another with no trace of such parameres. These two types are used here as the basis for recognition of two subfamilies. Since Baguena's classification of the family into subfamilies and tribes does not include consideration of male genitalia, this provisional classification cannot be correlated with his without further study and dissection of type-species.

The provisional reclassification is as follows:

- Male genitalia with lateral parameres (Fig. 71) ..... Subfamily I
- [*Vanonus piceus* an exception]

- Hind femora without a brush in either sex ..... Tribe 1  
 [included genera *Ganascus* Casey, *Gymnoganascus* Werner]
- Hind femora with a posterior brush at least several setae thick in both sexes ... Tribe 2  
 [included genus *Vanonus* Casey]
- Male genitalia without lateral parameres ..... Subfamily II
- Last visible sternum of female without a median pit. Hind femora without a posterior brush or with a very reduced brush in both sexes ..... Tribe 1  
 [included genera *Aderus* Westwood, *Ariotus* Casey, *Axylophilus* Casey, *Cnopus* Champion, *Emelinus* Casey, *Pseudariotus* Casey]
- Last visible sternum of female with a median pit. Hind femora either without a brush or with a very extensive pad covering underside in male ..... Tribe 2  
 [included genera *Elonus* Casey, *Zonantes* Casey]

Most of the Nearctic genera are probably limited to the Western Hemisphere, and some contain species in the Neotropical Region. Two genera, *Aderus* and *Vanonus*, contain Palaearctic species, and the former has additional species in other regions, including the Neotropics. The limits of Casey's genera have been broadened in several instances, making them less homogeneous but reducing the need to establish additional genera.

#### KEY TO NEARCTIC GENERA

1. Hind femora with a brush along at least 1/8 of hind margin, sometimes on a lobe or extending onto ventral surface ..... 2
- Hind femora without a brush, at most with an inconspicuous, elongate, seta-filled pit (Fig. 15) ..... 4
- 2(1). Underside of abdomen with a large elevated plate bordered by dense golden pubescence (Fig. 47). Most of underside of expanded hind femora covered by a dense brush ..... male *Elonus*
- Underside of abdomen without an elevated plate. Brush of hind femora much less extensive, confined to posterior border in most species ..... 3
- 3(2). Brush on hind femora at least several setae thick, sometimes on a lobe (Figs. 5-7, 56-58, 69) ..... *Vanonus*
- Brush on hind femora one seta thick (Fig. 63), sometimes inconspicuous ... *Ariotus*
- 4(1). Antennal segment 3 subequal to segment 2, shorter than segment 4 (Fig. 65) *Aderus*
- Antennal segment 3 longer than segment 2, longer than or subequal to segment 4 (Figs. 64, 66) ..... 5
- 5(4). Segment 1 of hind tarsi shorter than segments 2-4 combined ..... *Cnopus*
- Segment 1 of hind tarsi longer than segments 2-4 combined ..... 6
- 6(5). Basal abdominal sterna with lateral patches of dense golden pubescence and last exposed sternum with a small pit on midline (Fig. 70). Dorsal pubescence including dense, laterally directed interstitial setae ..... female *Elonus*
- Basal abdominal sterna without lateral patches of dense golden pubescence. If pit present on midline of last abdominal sternum, interstitial setae lacking ..... 7
- 7(6). Upperside with dense interstitial setae involved in a color pattern, either in patches or over whole surface (Figs. 1, 2) ..... *Ganascus*
- Elytra without interstitial setae, or such setae present and not involved in a color pattern ..... 8
- 8(7). Tiny, less than 1.1 mm long, rarely collected, heavy-bodied species (Figs. 48, 54) ..... 9
- Larger, more than 1.1 mm long, species, not so heavy-bodied ..... 10

- 9(8). Front of head bulging from level of eyes to frontoclypeal suture; eyes deeply emarginate (Fig. 49) . . . . . *Axylophilus*
- Front of head normally convex; eyes not emarginate (Fig. 48) . . . . . *Gymnoganasculus*
- 10(8). Hind femora with a long, seta-filled pit on underside of posterior edge (Fig. 15) . . . . . *Pseudariotus*
- Hind femora without seta-filled pit . . . . . 11
- 11(10). Last visible sternum of female with a small median pit (Fig. 59). Male with antennae simple, front trochanters usually bearing a small spine. Hind angles of prothorax without tuft of setae . . . . . *Zonantes*
- Last visible sternum of female without pit. Male antennae flabellate (Fig. 64), front trochanters not spined. Hind angles of prothorax with tuft of setae (Fig. 18) . . . . . *Emelinus*

SUBFAMILY I

*Diagnosis.* Male genitalia with lateral parameres in addition to a median tegmen (Fig. 71). Hind femora without a brush, or brush several setae wide present on posterior side in both sexes. Interstitial setae present or absent. [*Vanonus piceus* (LeConte) has a brush on the hind femora in both sexes, but the male genitalia lack lateral parameres. It is left in *Vanonus* because of its great external similarity to some other species, but may have to be reassigned.]

Subfamily I, Tribe 1

*Diagnosis.* Hind femora lacking a brush of any kind in either sex. Two Nearctic genera.

*Ganasculus* Casey

*Ganasculus* Casey 1895:803 (type-species: *Xylophilus ventricosus* LeConte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:27.  
*Sandytes* Casey 1895:806 (type-species: *Xylophilus ptinoides* Schwarz, by monotypy). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:28. **New synonymy.**

*Discussion.* Casey established this genus for three species, here treated as *G. ventricosus*. The genus is redefined to include the two Nearctic species in which the male genitalia have separate parameres, the hind femora lack any sort of brush in either sex, the prothorax is constricted laterally near the middle, and dense interstitial setae are involved in a color pattern. The two Nearctic species are very different from each other. Additional species seen from the West Indies and Central America; one from the West Indies is somewhat intermediate between the Nearctic species.

Key to Species

- 1. Whole surface with primary and interstitial setae involved in a brown and gray color pattern. Robust, of form similar to *Anthrenus* in the Dermestidae, the eyes not protruding and antennae not particularly slender . . . . . *Ganasculus ventricosus*
- Most of surface shiny and devoid of interstitial setae, but patches of dense gray interstitial setae forming isolated markings on pronotum and elytra. Form similar to *Ptinus* in the Ptinidae; elytra robust, prothorax narrow, only ca. 1/2 as wide as elytra; eyes protruding and antennae unusually slender . . . . . *Ganasculus ptinoides*

*Ganascus ventricosus* (LeConte)

Fig. 1

*Xylophilus ventricosus* LeConte 1875:176. [Described from "Southern States." Lectotype, new designation, sex?, in LeConte Coll., MCZC, labeled "orange disk / ventricosus type (in pencil) / ventricosus 2," examined.] Casey, 1895:804 (*Ganascus*).

*Ganascus opimus* Casey 1895:805. [Holotype, sex?, labeled "Tex with ink dot under e / Type USNM 36513 / opimus Csy" in Casey Coll., USNM, examined by D. S. Chandler.] **New synonymy.**

*Ganascus palliatus* Casey 1895:806. [Lectotype, new designation, sex?, labeled "Tampa, Fla. 27.4 / Type USNM 36514 / palliatus Csy" in Casey Coll., USNM, examined by D. S. Chandler.] **New synonymy.**

*Diagnosis.* Robust, prothorax subquadrate with sides slightly indented at middle. Brown but pale on all but middle of pronotum, scutellum, cuticle under pale pubescence, antennae, palpi, tarsi and parts of tibiae. Shiny, with evenly spaced dense punctures, surface partly concealed by dense, appressed interstitial setae. These and the primary setae form a brown and silvery gray color pattern dorsally, best described as variegated but basically bilaterally symmetrical. There is some variation in the denseness of the pubescence in different specimens, reflected in the synonymy. Separation of eyes 32%, length of antennae 132% of head width in male, 33% and 135% in female; sexing specimens almost impossible without dissection. Length 1.76, width 1.06 mm, elytra 1.41 (1.35–1.57) mm long.

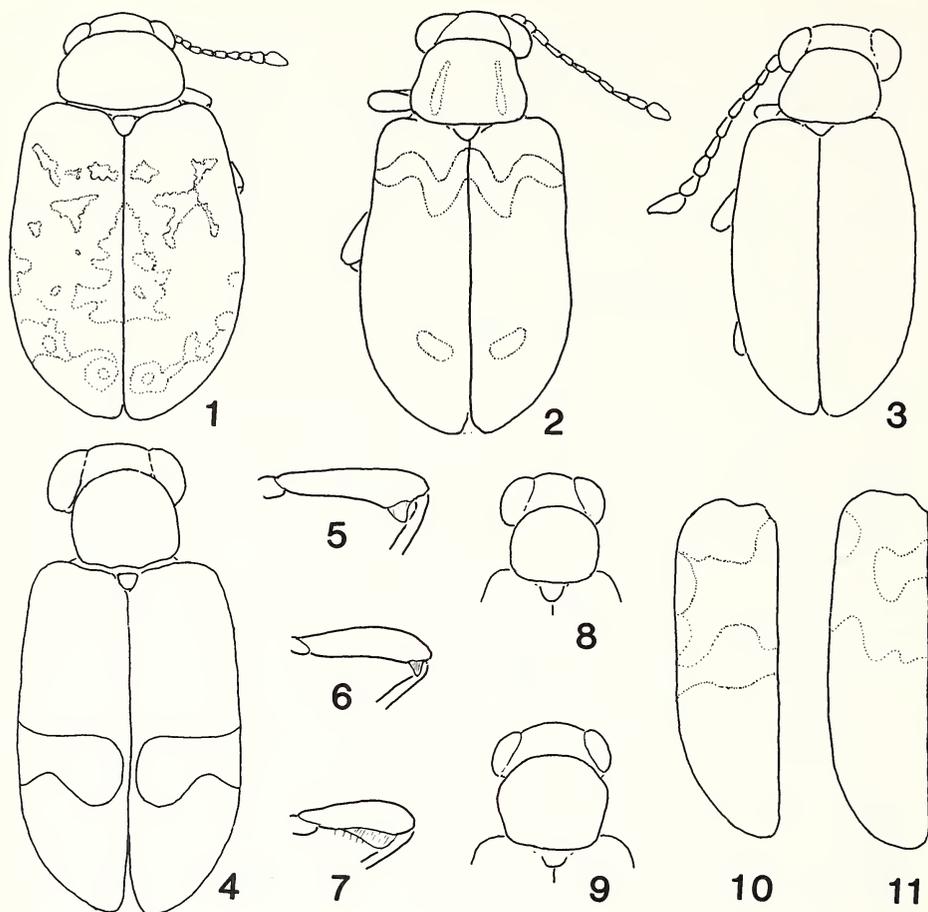
*Distribution.* Coastal region from Georgia to Texas, with scattered records as far north as Indiana and possibly New Hampshire. Alabama: Mobile. Arkansas: Polk Co. Florida: Archer, Camp Mahachie, Crystal Beach, Daytona, Dunedin, Englewood, Enterprise, Everglades National Park, Ft. Ogdon, Gainesville, Gulf Co., Highlands Hammock, Jackson Co., Key Largo, Lakeland, Lake Worth, Leon Co., Loggerhead Key (Dry Tortugas), Manatee Springs, Miami, Monroe Co., Myakka R. S., Tallahassee, Tall Timbers, Tampa (Casey, 1895, *palliatus*), Torreya State Park, Vero Beach, Welaka. Georgia: Athens, Tybee Island. Indiana: Harvey Lake. Louisiana: Baton Rouge. Maryland (state label). New Hampshire: Durham (mislabelled?). Oklahoma: Latimer Co. Tennessee (state label). Texas: Austin (Casey, 1895, *opimus*), Bandera Co., Bastrop, Cameron Co. (Sabal Palm Grove & Southmost), Hidalgo Co., Seabrook (CNCI, CUIC, DENH, EGRC, FMNH, FSCA, ICCM, KSTC, LSUC, MCTC, MCZC, OSUC, PSKC, SEMC, UAIC).

*Ganascus ptinoides* (Schwarz), **New Combination**

Fig. 2

*Xylophilus ptinoides* Schwarz 1878:371. [Lectotype, new designation, male, labeled "Enterprise, Fla, 16.6 / Coll. Hubbard & Schwarz / type! Schwarz / Type No. 4534 U.S.N.M." in USNM, examined by D. S. Chandler.] Casey, 1895:807 (*Sandytes*).

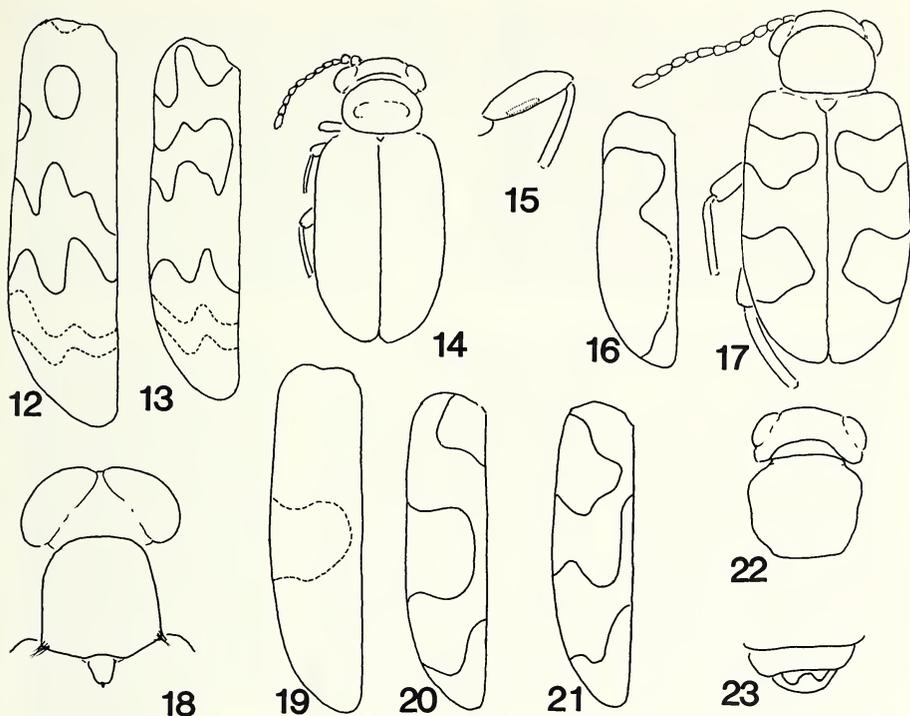
*Diagnosis.* Dark brown, paler under white markings, shiny, deeply punctured, rather robust but prothorax rather narrow and eyes protruding beyond its sides; head 108% as wide as prothorax in male. Antennae slender, long and threadlike in male, less so in female, yellowish with segment 11 thicker, brown. Tibiae, and sometimes



Figs. 1-11. Camera lucida sketches, 30 $\times$ . 1-4 Habitus. 1. *Ganascus ventricosus*. 2. *Ganascus ptinoides*. 3. *Vanonus uniformis*. 4. *Vanonus balteatus*. 5-7. Hind femur, 40 $\times$ . 5. *Vanonus wickhami* female. 6. *Vanonus vigilans* female. 7. *Vanonus oklahomensis* female. 8, 9. Forebody. 8. *Vanonus macrops*. 9. *Vanonus valgus*. 10, 11. Left elytron. 10. *Aderus brunnipennis*. 11. *Aderus populneus*.

most of legs, pale. Head and prothorax with some lateral appressed white pubescence, including interstitial setae, in sublateral lines on latter, and also in patches on elytra. When fully developed the elytral patches form a zig-zag pattern across the postbasal transverse impression, a more regular postmedian band and an incomplete band behind it. Separation of eyes 31%, length of antennae 182% of head width in male, 24% and 164% in female. Length 1.58, width 0.80 mm, elytra 1.24 (1.10-1.28) mm long.

*Distribution.* Florida and eastern Oklahoma. Florida: Dunedin, Enterprise (Schwarz, 1878), Gainesville, Haw Creek, Highlands Hammock, New Smyrna (Schwarz, 1878). Oklahoma: Latimer Co. (CNCI, CUIC, FSCA, ICCM, KSTC, MCTC, MCZC, UAIC).



Figs. 12–23. Camera lucida sketches, 30×. 12, 13. *Emelinus melsheimeri* elytra. 14. *Cnopus impressus* habitus. 15–17. *Pseudariotus notatus*. 15. Male hind femur. 16. Elytron. 17. Habitus. 18. *Emelinus melsheimeri* male forebody. 19–21. Elytra. 19. *Ariotus subtropicus*. 20, 21. *Ariotus quercicola*. 22. *Ariotus subtropicus* forebody. 23. *Ariotus quercicola* male apex of abdomen.

### **Gymnoganascus** Werner, new genus

*Diagnosis.* Robust and thick-bodied, with inconspicuous pubescence not affecting color. Antennae stout in both sexes, the outer segments transverse. Legs not modified in male, but female with a fringe of longer setae on outer edge of hind tibiae. Separation of visible sterna 1 and 2 barely indicated. Male with no obvious modification of apex of abdomen.

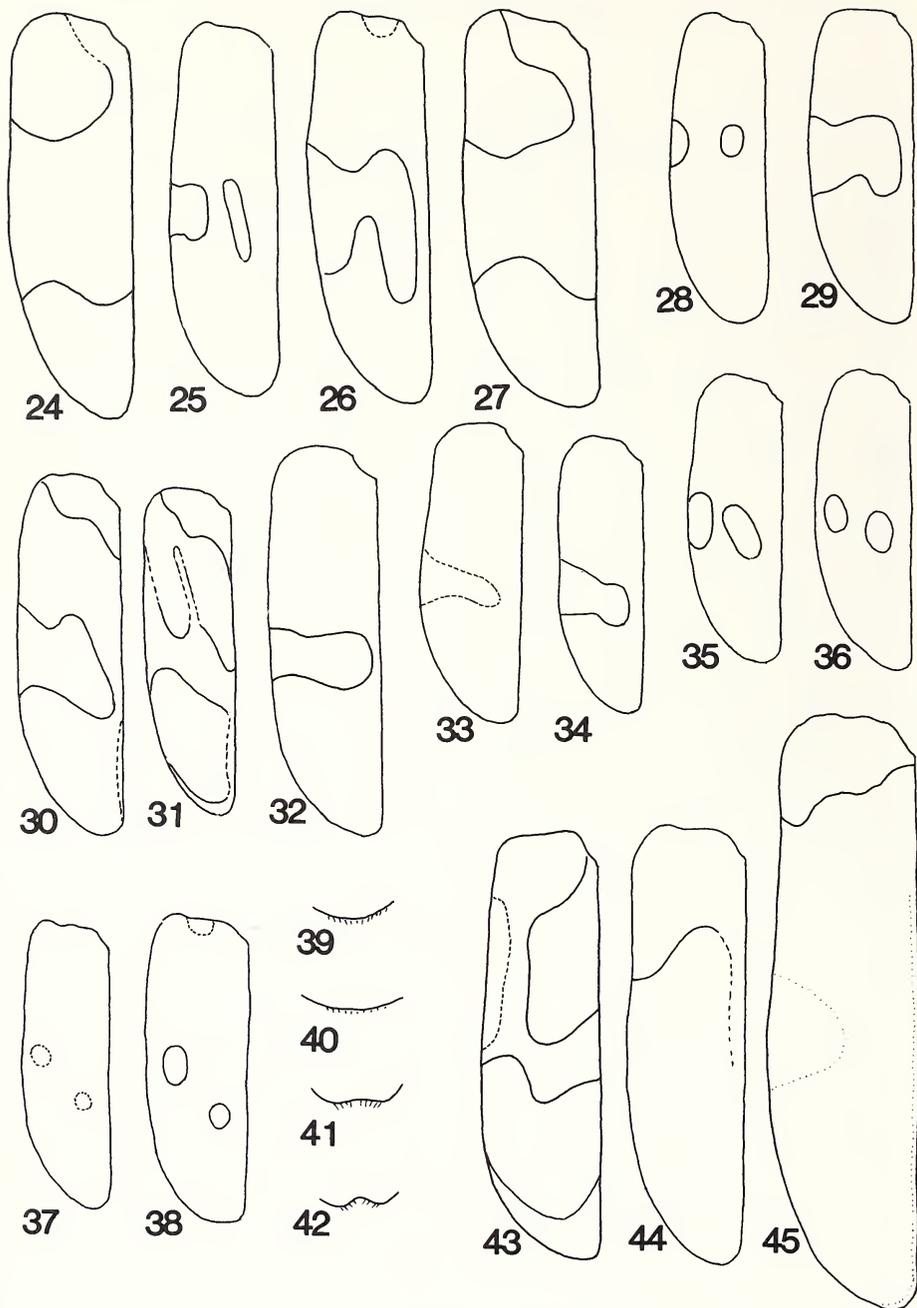
*Type-species.* *Gymnoganascus stephani* Werner.

### **Gymnoganascus stephani**, new species

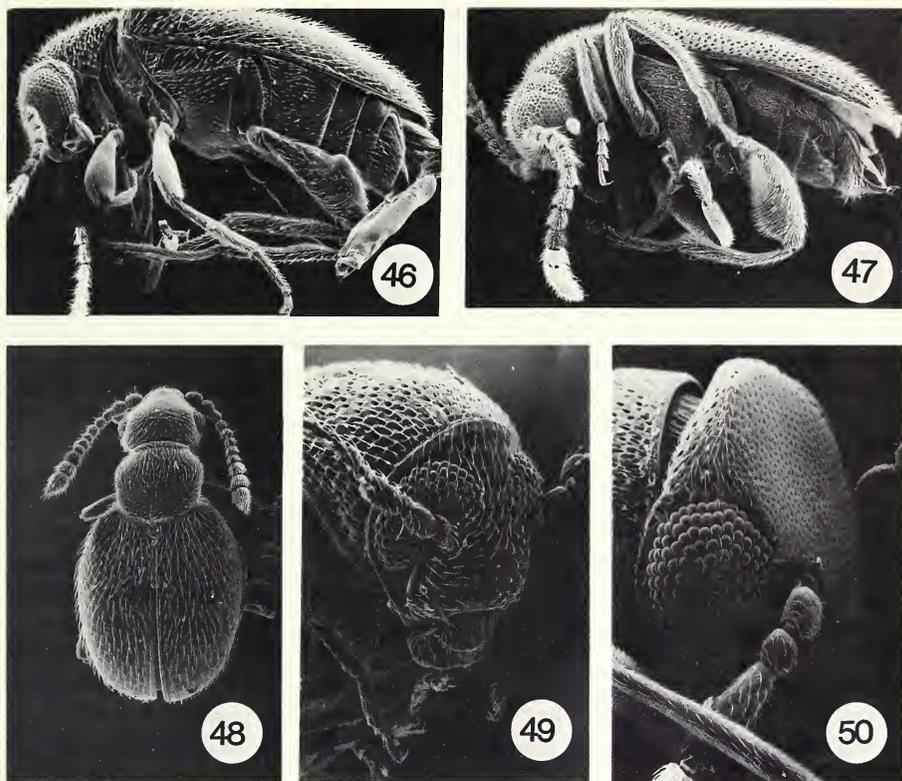
Fig. 48

*Diagnosis.* A tiny, convex species with inconspicuous pubescence, small eyes and short antennae. Separation of eyes 68%, length of antennae 154% of head width in male, 71% and 150% in female. Length 0.91, width 0.49 mm, elytra 0.69 (0.61–0.69; 0.76–0.81 in Queretaro specimens) mm long.

*Description.* Holotype: male, 0.91 mm long with head deflexed, pale reddish, shiny; elytra evenly convex, with distinct humeri, moderately deeply and densely punctured



Figs. 24-45. Camera lucida sketches, 30 $\times$ . 24-42. *Zonantes* spp. 24-38. Elytra. 24. *Z. fasciatus*. 25-27. *Z. hubbardi*. 28, 29. *Z. subfasciatus*. 30, 31. *Z. nubifer*. 32. *Z. ouachitanus*. 33, 34. *Z. pallidus*. 35, 36. *Z. floridanus*. 37, 38. *Z. signatus*. 39-42. Apex of last visible tergum of female. 39. *Z. signatus*. 40. *Z. pallidus*. 41. *Z. subfasciatus*. 42. *Z. floridanus*. 43-45. *Elonus* spp. elytra. 43. *E. nebulosus*. 44. *E. hesperus*. 45. *E. basalis*.



Figs. 46–50. SEM photographs. 46. *Zonantes fasciatus* male, 21 $\times$ . 47. *Elonus hesperus* male, 18 $\times$ . 48. *Gymnogonascus stephani*, 42 $\times$ . 49. *Axylophilus yuccae* head, 85 $\times$ . 50. *Vanonus piceus* male head, 103 $\times$ .

(ca. 0.02 mm separation), the punctures bearing slightly curved, almost appressed setae 0.06 mm long; head and pronotum separately convex, with very fine punctures and shorter appressed setae; underside with punctures slightly deeper. Head 0.22 mm long to strong frontoclypeal suture, 0.28 mm wide across eyes, portion behind eyes 0.25 wide, 0.06 long, the sides starting to curve at eyes, the base almost straight. Eyes small but prominent, 0.09  $\times$  0.06 mm, their front margins almost straight and well separated from bases of antennae. A distinct ridge extends from the middle of each eye, slightly diagonally and then straight forward across bases of antennae, the 2 ridges 0.09 mm apart. Antennae 0.43 mm long, stout, segments 9–11 forming a club. Antennal segment 1 oval, 2 slightly narrower than 1 but stouter than 3, 4–9 of almost equal length, progressing from oval to broader than long; 9–11 abruptly wider, 8 0.04 mm wide, 9 0.06, 9 and 10 transverse, 11 broadest, obliquely truncate; 9–11 combined 0.13 mm long. Prothorax evenly convex, 0.24 mm long, widest anterior to middle, 0.27 mm, the sides just perceptibly convex from there to base, where 0.24 mm wide, narrowly curved anteriorly to short collar region 0.19 mm wide. Elytra convex, with a faint indication of a postbasal transverse impression and distinct

humeri, which embrace the base of the prothorax; 0.69 mm long, widest, 0.49, at basal  $\frac{1}{3}$ , 0.32 at points of humeri. Legs not obviously modified. Genitalia slender, with slender tegmen and parameres 0.06 mm long and less than 0.01 mm wide, bearing 3 long setae apically. Allotype: female, very similar to holotype, elytra 0.69 mm long. Head 0.28 mm wide across eyes. Hind tibiae with a fringe of long, decumbent setae on posterior side, stuck down in this specimen but decumbent and ca. 0.04 mm long in one from Queretaro.

*Specimens examined.* Known from four localities in the U.S.A. (eastern Oklahoma, eastern Texas and Kentucky), Queretaro in Mexico, and Cuba in the West Indies. Holotype: male, Oklahoma: Latimer Co., 4-IV-83, Karl Stephan/lowland forest, sifting litter. Allotype: female, same locality, XII-85/sifting forest litter. Holotype and allotype in USNM, paratypes in FSCA, FMNH. Paratypes (8): 4 males, 2 females same locality, 5 taken sifting litter and 1 in flight trap, V-83. 1 male, Oklahoma: Marshall Co., 1 mi SE Willis, 12.VII.1968/marsh floor near temp. pond, W. Suter. 1 male, Kentucky: Edmonson Co., Mammoth Cave N.P., Cabin Woods, Subt., 18 March 1972, W. Suter. Not designated as paratypes: 1 male, Texas: Bastrop Co., Buescher State Pk., VI.15-17.1973/leaf litter forest floor, A. Newton, MCZC. 1 male, 2 females, Mexico: Queretaro: 18 mi E Landa de Matamoros, 5,300 ft, VII-14-1969, S. & J. Peck/Ber. 169, pine-oak litter, FMNH, MCZC. 1 female, Cuba: Soledad (nr.) Cienfuegos, X-15-1926, Darlington, MCZC (FMNH, FSCA, KSTC, MCZC, UAIC, USNM).

*Discussion.* The seven specimens taken by sifting in Latimer Co., Oklahoma are very similar to each other and the one from Kentucky. The others differ in having sparse, fine interstitial setae on the elytra, and seem to have slightly shorter primary setae. The specimen from Cuba has longer tactile setae. Specimens from the U.S.A. are smaller; those from Queretaro may have slightly more slender legs. Named for Karl Stephan, who recognized the species as undescribed soon after he collected it.

#### Subfamily I, Tribe 2

*Diagnosis.* Hind femora with some kind of a brush several setae thick on posterior side in both sexes. Genus *Vanonus*.

#### Genus *Vanonus* Casey

*Vanonus* Casey 1895:791 (type-species: *Vanonus wickhami* Casey, new designation);

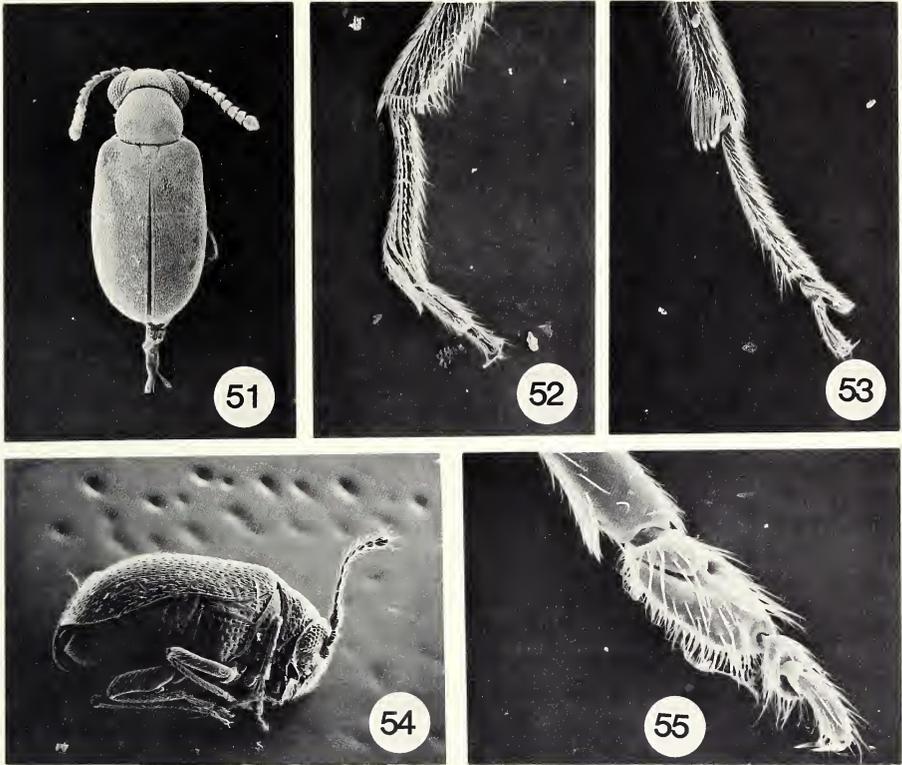
1905:161. Pic, 1905:235 (subgenus of *Hylophilus*). Israelson, 1971:110.

*Tanilotes* Casey 1895:798 (type-species: *Tanilotes lacustris* Casey, new designation).

Pic, 1905:235 (subgenus of *Hylophilus*).

*Pseudanidorus*: Baguena 1948:52, in part; not Pic, 1893:159 [from Baguena, 1948].

*Discussion.* Casey proposed this genus for a group of small, uniformly dark species with a posterior brush running the length of the hind femora, separating similar species in which the hind femora had a lobe or tooth in addition to a brush into the genus *Tanilotes*. He later (1905) decided that one species of *Tanilotes* was based on females and one of *Vanonus* on males of the same species, but was not aware that the female of one species has hind femora almost like those of males.



Figs. 51–55. SEM photographs. 51. *Vanonus musculus* male, 22×. 52. *Zonantes ater* female hind tibia, tarsus, 59×. 53. *Elonus nebulosus* female hind tibia, tarsus, 56×. 54. *Axylophilus yuccae*, 33×. 55. *Pseudariotus notatus* male front tarsus, 175×.

As here redefined, the genus *Vanonus* includes all Nearctic species in which the hind femora have a brush more than one seta thick on the hind margin, but with the brush not expanded into a large ventral pad as it is in the males of most species of *Elonus*. The genus is represented in the Palaearctic Region by at least a few species. In the males of most species the genitalia have slender parameres, each bearing three apical setae. *Vanonus piceus* does not, and may not belong in the genus. It is left here provisionally, but its proper placement is probably elsewhere. In all known species the brush on the hind femora of the male extends from near base to near apex and is of almost even width. The brush on the female hind femora varies from male-like to a broad lobe or tooth, and may not extend the whole length.

Key to Species

- 1. Pale, elytra with a brown band (Fig. 4) ..... *Vanonus balteatus*
- Uniformly dark or head darker and/or appendages paler, elytra without a mid-band ..... 2

2(1).	Front of head strongly flattened (Fig. 50) .....	3
-	Front of head normally convex .....	4
3(2).	Head and elytra strongly microreticulate. Genitalia with separate parameres .....	
-	..... male <i>Vanonus calvescens</i>	
-	Surface not microreticulate. Genitalia lacking separate parameres .....	
-	..... male <i>Vanonus piceus</i>	
4(2).	Prothorax broadest anterior to middle (Fig. 9). Interstitial setae of elytra much denser than primary setae. Female hind femora strongly bowed at base, with a large posterior lobe in distal half, the lobe flat and covered with dense pubescence ventrally (Fig. 56) .....	<i>Vanonus valgus</i>
-	Prothorax broadest at or behind middle. Pubescence and hind femora variable .....	5
5(4).	Hind femora with part of posterior brush expanded, or with a posterior tooth. Females .....	6
-	Hind femora with brush of even width. Males, and female of one species. [Male of <i>oklahomensis</i> unknown.] .....	11
6(5).	Brush of hind femora about equally distributed between proximal and distal halves of femur .....	7
-	Brush of hind femora nearly or entirely confined to distal half of femur .....	8
7(6).	Brush of hind femora abbreviated well before base and apex, and with a strong triangular expansion just basad of middle of femur (Fig. 69). Elytral interstitial setae much denser than primary setae .....	female <i>Vanonus musculus</i>
-	Brush of hind femora extending from near base to near apex, with a feeble expansion just basad of middle of femur. Elytral interstitial setae sparse and inconspicuous (Fig. 57) .....	female <i>Vanonus piceus</i>
8(6).	Hind femora with a large rounded posterior lobe, occupying distal half .....	9
-	Hind femora with pointed brush or tooth, confined to distal fourth .....	10
9(8).	Femoral lobe strongly downcurved (Fig. 58) .....	female <i>Vanonus huronicus</i>
-	Femoral lobe flat (Fig. 7) .....	female <i>Vanonus oklahomensis</i>
10(8).	Tooth of hind femora based on cuticle, with some setae extending beyond its apex, which lies distinctly before apex of femur (Fig. 5). Eyes moderately small, separated by ca. 60% of head width .....	female <i>Vanonus wickhami</i>
-	Tooth of hind femora consisting almost entirely of setae, which form a tooth that is gently sloped from base to point, then almost perpendicular to femur, dropping close to apex of femur (Fig. 6). Eyes not so small, separated by ca. 50% of head width .....	female <i>Vanonus vigilans</i>
11(5).	Antennal segments 7-10 distinctly thicker and longer than segments 4-6 .....	female <i>Vanonus sagax</i>
-	Antennal segments 4-10 subequal in length, gradually increasing in thickness except in <i>uniformis</i> . Males .....	12
12(11).	Antebasal transverse depression of pronotum weak or absent, at least not distinct across midline. Interstitial setae of elytra either much more numerous, shorter and more appressed than primary setae, or completely absent .....	13
-	Antebasal transverse depression of pronotum distinct across midline. Interstitial setae of elytra twice as numerous as primary setae or sparser, and difficult to distinguish from them .....	16
13(12).	Elytra shiny, without interstitial setae. Dark, elytral humeri obscurely paler, and appendages paler .....	male <i>Vanonus uniformis</i>
-	Elytra with dense interstitial setae .....	14
14(13).	Usually reddish brown with head darker and appendages pale .....	15
-	Usually dark brown, antennae, palpi and tibiae paler .....	male <i>Vanonus sagax</i>
15(14).	Parameres more than twice as long as broad, in form of a truncate paddle (Fig. 71) .....	male <i>Vanonus musculus</i>

- Parameres less than twice as long as broad. [female unknown] ..... male *Vanonus macrops*
- 16(12). Eyes unusually small, separated by ca. 60% of head width male *Vanonus wickhami*
- Eyes separated by 50% of head width or less ..... 17
- 17(16). Eyes larger, separated by ca. 35% of head width. Slightly larger, elytra 1.06–1.46 mm. Parameres more than 4 times as long as wide, sticklike ..... male *Vanonus huronicus*
- Eyes smaller, separated by ca. 50% of head width. Smaller, elytra 1.04–1.20 mm. Parameres about 3 times as long as wide ..... male *Vanonus vigilans*

#### Wickhami-Group

*Diagnosis.* Placed here are all of the species of *Vanonus* with symmetrical lateral plates on the internal sac of the male genitalia (Israelson, 1971, figs. 1, 2). None of the known species has any contrasting markings on the elytra; all are either uniformly dark or have the head darker and the prothorax paler than the rest of the upper surface. Males have antennae of almost uniform thickness, and hind femora bearing a brush of almost uniform width on the hind margin. None of the known species has the male head flattened in front. Females have the antennae thickened toward the apex, slightly clublike, and have the hind femora variously modified but always bearing a brush, from almost as in the male but with the brush slightly broader at the apex to strongly lobed with both setae and the femur itself involved.

*Discussion.* The group is largely Nearctic. Israelson (1971) has assigned *brevicornis* (Perris) from Europe and its subspecies *rotundaticollis* Israelson from the Canary Islands to *Vanonus*. Both *brevicornis* and *pentatomus* (Thomson) from Europe appear from Israelson's figures of genitalia (1970, 1971) to belong to the Wickhami-Group.

*Vanonus vigilans* and *V. wickhami* form one subgroup, *huronicus*, *oklahomensis* and *valgus* another; *sagax*, *macrops* and *musculus* seem to have no close relatives.

#### *Vanonus huronicus* Casey

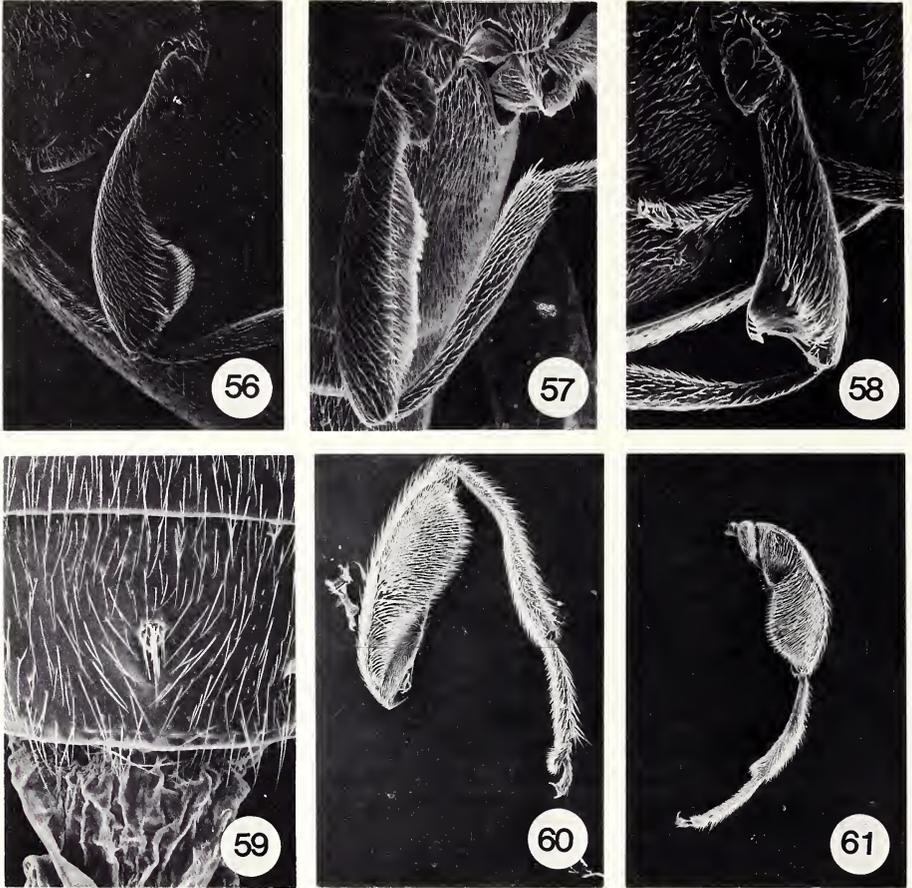
##### Fig. 58

*Vanonus huronicus* Casey 1895:796. [Holotype, male, in Casey Coll., USNM, labeled "Mic. / Type USNM 36505 / huronicus Csy." Remounted on card by Israelson; genitalia placed in vial by Werner.] Israelson, 1971:110–111.

*Tanilotes densus* Casey 1895:799. [Described from "Pennsylvania (near Philadelphia)." Holotype, female, in Casey Coll., USNM, labeled "Penn, in red ink / Type USNM 36510 / densus Csy.," examined.] Casey, 1905:163 (*Vanonus*). **New synonymy.**

*Diagnosis.* Reddish tan, head darker, appendages reddish; moderately elongate, subparallel, pronotum with an almost complete antebasal transverse depression. Moderately densely, finely punctured and short appressed pubescent, the interstitial setae sparse in northern individuals, moderately dense in the single Oklahoma specimen. Separation of eyes 34%, length of antennae 152% of head width in male, 40% and 130% in female. Length 1.85, width 0.79 mm, elytra 1.44 (1.07–1.44) mm long.

*Discussion.* The Oklahoma specimen, a female, has the eyes relatively large, 0.26 × 0.20 mm. Hind femur (Fig. 58) 0.46 mm long, with a flat tooth from 0.26 to apex, ogival in profile and 0.07 mm high, its apex strongly and abruptly curved ventrad



Figs. 56-61. SEM photographs. 56-58. *Vanonus* hind femora. 56. *V. valgus* female, 82 $\times$ . 57. *V. piceus* female, 95 $\times$ . 58. *V. huronicus* female, 84 $\times$ . 59. *Zonantes fasciatus* female, last visible sternum, 110 $\times$ . 60, 61. *Elonus* hind femora. 60. *E. basalis* male. 61. *E. nebulosus* male.

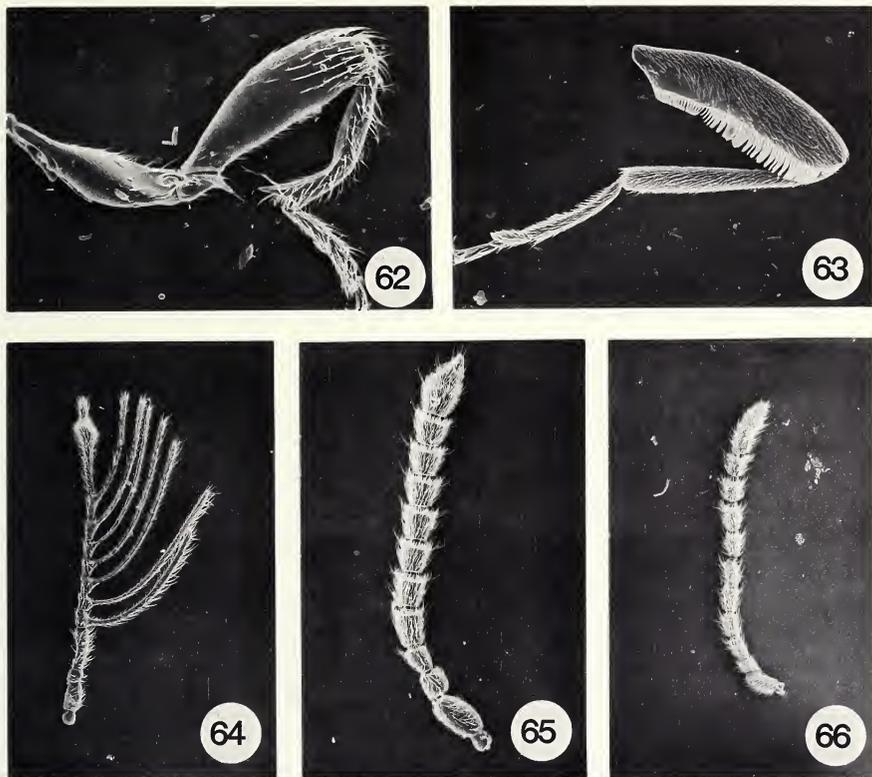
and more pointed; whole ventral surface of tooth with dense, appressed setae, its dorsal surface, including downbent portion, glabrous.

*Distribution.* Massachusetts to Wisconsin, south to eastern Oklahoma. Illinois: Ottawa (LaSalle Co.). Indiana: Indianapolis, Tippecanoe Co. Michigan: (Casey, 1895, *huronicus*). Oklahoma: Latimer Co. Pennsylvania: near Philadelphia (Casey, 1895, *densus*) (KSTC, MCZC, NMDC, UAIC, UMRM, USNM).

***Vanonus macrops*, new species**

Fig. 8

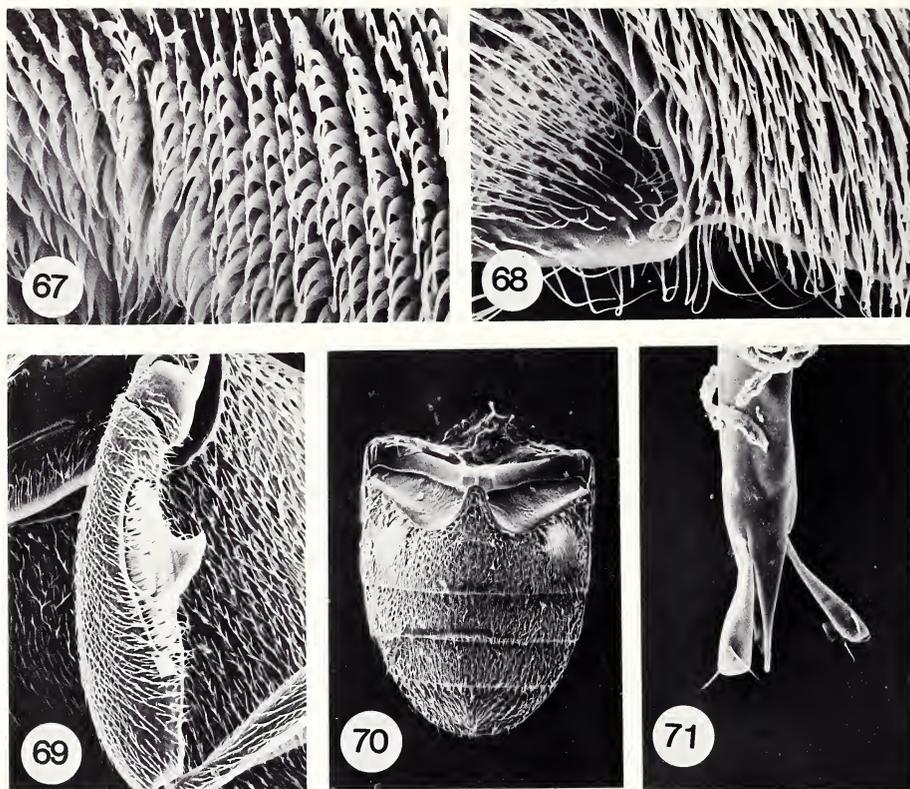
*Diagnosis.* Reddish brown with slightly paler appendages, black head, Interstitial setae of upperside denser than appressed primary setae, slightly finer and forming a



Figs. 62–66. SEM photographs. 62. *Zonantes hubbardi* male, front leg, 55 $\times$ . 63. *Ariotus luteolus* male hind femur, 55 $\times$ . 64. *Emelinus melsheimeri* male antenna, 21 $\times$ . 65. *Aderus brunnipennis* male antenna, 55 $\times$ . 66. *Elonus basalis* male antenna, 18 $\times$ .

gray layer. Separation of eyes 30%, length of antennae 128% of head width in male; female unknown. Length 1.46, width 0.63 mm, elytra 1.09 mm long.

*Description.* Holotype, male: head 0.28 mm long to frontoclypeal suture, 0.46 wide across eyes, 0.25 behind. Eyes 0.23  $\times$  0.19 mm, separated by 0.14, a line across their hind margins 0.02 from middle of slightly curved base, <0.01 mm from side margins of head. Antennae 0.59 mm long, gradually thicker to 0.07 wide at apex. Head punctures fine, sharply defined, ca. 0.02 mm center to center; interstitial setae present but not concealing dark color. Prothorax 0.31 mm long, 0.37 wide at base, 0.39 near middle, 0.26 at apex; antebasal transverse depression very feeble. Punctures slightly denser than on head and interstitial pubescence denser than on elytra. Elytra 1.09 mm long, 0.48 wide across humeri, 0.63 maximum, with feeble omoplates. Punctures ca. 0.02 mm apart, primary setae 0.02+ mm long, appressed, slightly curved, distinct from interstitial setae, which are dense to about middle of elytra, gradually sparser behind, finer and more appressed than primary setae. Underside more sparsely pubescent. Hind femora 0.41 mm long, with brush from 0.06 to 0.35. Parameres of aedeagus short and broad, ca. 0.07  $\times$  0.05 mm, with 2 apical setae.



Figs. 67–71. SEM photographs. 67, 68. Details of *Elonus* hind femur. 67. *E. hesperus* male, 242 $\times$ . 68. *E. nebulosus* male, 177 $\times$ . 69. *Vanonus musculus* female hind leg, 120 $\times$ . 70. *Elonus nebulosus* female abdomen, 26 $\times$ . 71. *Vanonus musculus* male genitalia, 128 $\times$ .

*Specimens examined.* Known only from northcentral Missouri. Holotype: male, "1 mi. E. Moberly, MO, Randolph Co., 25 Aug. 73, E. G. Riley." Deposited in USNM. No other specimens seen.

***Vanonus musculus*, new species**

Figs. 51, 69, 71

*Diagnosis.* Reddish brown with brown head, paler appendages; sometimes darker. Elytra with short, appressed primary setae and much more numerous interstitial setae. Prothorax widest near middle and without antebasal transverse depression. Hind femora of female (Fig. 69) with a submedian triangle of setae projecting from a brush that extends along most of femur. Separation of eyes 31%, length of antennae 135% of head width in male, 42% and 127% in female. Length 1.69, width 0.73 mm, elytra 1.29 (1.15–1.31) mm long.

*Description.* Holotype, female: reddish brown with brown head, 1.69 mm long with head deflexed. Head 0.29 mm long to frontoclypeal suture, 0.49 wide across

eyes, 0.35 just behind. Eyes large,  $0.24 \times 0.19$ , separated by 0.18, separated from base of head on sides by width of one facet. Antennae fairly short, 0.62 mm, segments 7–10 truncate at base and apex, transverse, 11 thickest, 0.07 mm. Prothorax 0.37 mm long, 0.38 wide at base, 0.44 maximum. Elytra 1.29 mm long, 0.73 wide, 0.53 at points of distinct humeri. Posterior femora 0.44 mm long, 0.13 wide at widest, with a brush from 0.05 to 0.27 mm from base, in a depression that is distinctly margined in front, the brush 0.05 mm wide maximum and containing a flat, triangular peak 0.04 mm high, 0.09 long, the proximal side nearly perpendicular and 0.17 mm from base, the distal side tapering to 0.26 mm, from an acute angle at the point; hind margin of femur with a slight bulge, ca. 0.02 mm, at level of peak. Allotype: male, head 0.28 mm long, prothorax 0.33, elytra 1.15. Eyes  $0.23 \times 0.19$  mm, separated by 0.16, head 0.47 wide across them. Antennae slightly longer, 0.67 mm, with last segment comparable, 0.08 mm thick, middle segments nearly quadrate. Posterior femora  $0.44 \times 0.12$  mm, with a brush 0.06 mm wide, 0.07 to 0.37 mm from base. Genitalia moderately slender with parameres short and truncate, with 3 apical setae. The name means little mouse, in reference to the dense pubescence.

*Specimens examined.* Eastern Oklahoma and Missouri. Holotype, female: Oklahoma: Latimer Co., VIII-1984, K. Stephan/beating up-land forest. Allotype, male, same data. Holotype and allotype in USNM. Paratypes: 10 males, 8 females, same locality. 1 male paratype, 2 specimens with legs missing, Missouri: Randolph Co., 1 mi E Moberly, Jul. & Sept., E. G. Riley (EGRC, FSCA, KSTC, UAIC, USNM).

### ***Vanonus oklahomensis*, new species**

Fig. 7

*Diagnosis.* Brown, femora brownish, rest of appendages dull yellow, head black; elytral pubescence sparse, not concealing shiny surface. Female posterior femora with a rounded flat posterior lobe in distal half. Separation of eyes 36%, length of antennae 130% of head width in female; male unknown. Length 1.44, width 0.65 mm, elytra 1.09 mm long.

*Description.* Holotype, female: 1.44 mm long with head deflexed. Antennae short, 0.57 mm, segments 4–6 small, submoniliform, 7–11 forming a weak club, 10–11 0.08 mm thick, 7 quadrate, 8–10 broader than long. Pronotum with weak antebasal transverse depression. Elytral primary and sparse interstitial setae short, appressed and inconspicuous. Head 0.28 mm long to frontoclypeal suture, 0.44 wide across eyes, 0.28 behind; eyes  $0.22 \times 0.17$  mm, separated by 0.16, a line across their hind margins 0.06 mm from middle of base, which is evenly curved. Head punctures small but distinct, ca. 0.02 mm apart, setae appressed, intervals shiny. Prothorax 0.27 mm long, 0.37 wide across base, 0.38 maximum slightly anterior to middle, 0.26 at apex. Punctures ca.  $\frac{1}{3}$  denser than on head, intervals subopaque. Elytra 1.09 mm long, 0.50 wide across points of humeri, 0.65 maximum, with weak omoplates; punctures ca. 0.02 mm apart, setae 0.03 mm long, appressed, slightly curved; primary and sparse interstitial setae barely distinguishable from each other, tactile setae suberect, 0.03 mm.

Hind femora 0.37 mm long, 0.06 wide at trochanter end, gradually wider to 0.11 at apical  $\frac{1}{4}$ , there augmented posteriorly to 0.16 mm by a row of stiff, straight setae, the brush starting at 0.13 mm from base, tapering slightly concavely to 0.19 mm

from base, then forming a rounded lobe to 0.28 mm from base, there ending abruptly and leaving apical 0.06 mm of femur without a brush; narrow part of brush with 3 slender, erect setae 0.04 mm long. Last visible sternum with 6 slender erect setae 0.04 mm long, across apex. Separation between visible sterna 1 and 2 barely discernible.

*Specimens examined.* Holotype: female, labeled "Oklahoma: Latimer Co., X-1985, Karl Stephan / beating low-land forest." Deposited in the USNM. No other specimens seen.

#### *Vanonus sagax* Casey

*Vanonus sagax* Casey 1895:796. [Holotype, male, in Casey Coll., USNM, labeled "Haulover, March 10 Fla / Type USNM 38506 / sagax Csy," examined.] Casey, 1905:164.

*Vanonus floridanus* Casey 1895:797. [Holotype, female, in Casey Coll., USNM, labeled "Crescent City, Fla. / Type USNM 36507 / floridanus Csy.," examined.] Casey, 1905:163. **New synonymy.**

*Diagnosis.* Usually brown with yellowish appendages, sometimes with head perceptibly darker. Prothorax broadest at or behind middle. Elytral pubescence distinctly double, of numerous short, appressed interstitial setae and distinctly different, longer decumbent primary setae. Eyes very large, reaching almost to hind margin of head. Pronotum with a feeble antebasal depression. Female hind femur with brush almost as long as femur, without expansions, but slightly broader at apex than in male. Separation of eyes 32%, length of antennae 149% of head width in male, 43% and 126% in female. Length 1.39, width 0.56 mm, elytra 1.00 (0.91–1.15) mm long.

*Distribution.* Florida to North Carolina, west to eastern Oklahoma. Alabama: Mobile, Theodore (Mobile Co.). Florida: Crescent City (Casey 1895, *floridanus*), Enterprise, Ft. Ogden, Gainesville, Hilliard, Indian River (Casey 1895, *sagax*), Lynn, Rainbow Springs (Marion Co.), Steinhatchee (Taylor Co.), Torreya State Park (Liberty Co.), Welaka. Mississippi: Stone Co. North Carolina: Town Creek (Brunswick Co.). Oklahoma: Latimer Co. (CNCI, DENH, FMNH, KSTC, MCZC, PSKC, SEMC, UAIC, UMIS, USNM).

#### ***Vanonus valgus*, new species**

Figs. 9, 56

*Diagnosis.* Moderately slender, brown, appendages paler, head darker in pale individuals. Prothorax broadest  $\frac{3}{5}$  from base, the sides angling back to base in a nearly straight line and more abruptly forward to collar region; with a shallow antebasal depression, not interrupted at middle. Punctures and pubescence almost as in *musculus*. Separation of eyes 32%, length of antennae 139% of head width in male, 36% and 135% in female. Length 1.59, width 0.76 mm, elytra 1.37 (1.19–1.50) mm long.

*Description.* Holotype, female: brown, head darker, appendages paler, 1.59 mm long with head deflexed; head 0.31 mm long to frontoclypeal suture, 0.51 wide across eyes, 0.31 behind; eyes large, 0.32 × 0.22 mm, separated by 0.19. Antennae 0.70 mm long, segment 11 thickest, 0.09 mm. Prothorax 0.41 mm long, 0.37 wide at base, 0.46 maximum, 0.30 at collar region. Elytra 1.37 mm long, 0.59 wide across

points of humeri, 0.76 maximum. Hind femora 0.47 mm long, 0.04 wide near base, bowed in basal portion, with a flat plate 0.24–0.43 mm from base, its apex rounded, to 0.07 mm wide and densely clothed with short, appressed setae ventrally. Dorsally, this plate consists of an expansion of the body of the femur, to ca. 0.14 mm, bordered by a narrow, shiny glabrous zone, ca. 0.02 mm wide and separated from body of femur by a ridge; packed setae apparently arising from underside and edge form a brush ca. 0.03 mm wide. Total width with brush 0.19 mm. Allotype: male, head 0.31 mm long, 0.51 wide across eyes, which are  $0.28 \times 0.22$  mm and separated by 0.17. Antennae 0.72 mm long, segment 11 0.09 mm wide. Prothorax 0.41 mm long, 0.44 wide; elytra 1.67 long. Hind femora 0.48 mm long, 0.13 wide at widest, with an elongate brush 0.05 mm wide, 0.11 to 0.43 mm from base. Basal half not bowed. Genitalia with slender parameres,  $0.17 \times 0.03$  mm, each bearing 3 terminal setae. The name refers to the bow-legged hind femora of females.

*Specimens examined.* Eastern Oklahoma to Florida. Holotype: female, Oklahoma: Latimer Co., VIII-85, K. Stephan/beating up-land forest. Allotype: male, same but May 1982. Holotype and allotype in USNM. Paratypes: Oklahoma: 2 males, 1 female, Latimer Co.; 1 female, Broken Bow, 13 June 1939, Kaiser-Neilon. Louisiana: 1 male, Catahoula Par., Sicily Island Hills W.M.A.; 1 female, Baton Rouge; 1 male, Feliciana Par., Tunica Hills W of Weyanoke. Florida: 1 male, Orange Co., Kelly Park Rock Springs; 1 male, Liberty Co., Torreya State Park; 1 female, Suwanee Co., 7 mi SE Branford (DENH, EGRC, FSCA, KSTC, LSUC, MCZC, UAIC, USNM).

*Vanonus vigilans* Casey

Fig. 6

*Vanonus vigilans* Casey 1895:795. [Described from "New York. Mr. H. H. Smith."

Casey also (1905) gives it as "New York (Hudson Valley)." Holotype, male, in Casey Coll., USNM, labeled "N.Y. with an ink line under the N / Type USNM 36502 / *vigilans* Csy," examined.] Casey, 1905:162.

*Diagnosis.* Reddish brown to dark brown, head darker, usually dark brown, appendages paler, antennae with segment 2 paler than rest. Pronotum with a distinct broad antebasal transverse depression, weak across midline. Pubescence moderately sparse, elytral setae ca. 0.02 mm, decumbent, slightly curved and nearly touching surface at tip; interstitial setae just perceptibly shorter, from very sparse to almost as numerous as setae in different individuals. Separation of eyes 41%, length of antennae 164% of head width in male, 50% and 146% in female. Length 1.46, width 0.66 mm, elytra 1.11 (1.04–1.20) mm long.

Female (Tyngsboro, Massachusetts): eyes moderately broad,  $0.22 \times 0.18$  mm, or 82% as wide as high, and protuberant (head 12% broader than prothorax). [In an associated male the eyes are slightly larger,  $0.24 \times 0.18$  mm, 75% as wide as high, and the head is 28% broader than the prothorax.] Antennal segments 7–10 thickened. Hind femora 0.44 mm long with a pubescence-filled excavation on posterior side from 0.28 to 0.41, distinctly margined above and below, setae alone forming a flat triangle 0.05 mm high from 0.37 to 0.41, peaking at 0.41 (peak beyond apex of femur in some others), sloping at ca. 45 degrees to apex, the femur there ca. 0.16 mm wide, then dropping at close to 90 degrees.

*Distribution.* Quebec to Michigan and south to Alabama. Canada: Ontario: Hull.

Quebec: Berthierville, Parc Gatineau. U.S.A.: Alabama: Moody (St. Clair Co.). Arkansas: Waldron (Scott Co.). Connecticut: Cornwall. Maryland: Lloyds. Maine: Brewer, Paris. Massachusetts: Berkley, Dorchester, Fall River, Framingham, Lincoln, Natick, Sherborn, Tyngsboro. Michigan: Gladwin Co. New Hampshire: Wonalancet (Carroll Co.). New Jersey: Highlands. New York: Hudson Valley (Casey, 1895). Pennsylvania: (Nunenmacher Coll.). Virginia: Penington Gap (CNCI, CUIIC, DENH, FMNH, FSCA, ICCM, MCZC, UAIC, USNM).

*Vanonus wickhami* Casey  
Fig. 5

*Vanonus wickhami* Casey 1895:797. [Holotype, male, in Casey Coll., USNM, labeled "Bayfield, Wis., Wickham / Type USNM 36508 / wickhami Csy.," examined.] Casey, 1905:163. Israelson, 1971:110-112.

*Tanilotes lacustris* Casey 1895:799. [Holotype, female, in Casey Coll., USNM, labeled "Bayfield, Wis., Wickham / Type USNM 36509 / Tanilotes lacustris Csy.," examined.] Israelson, 1971:112 (*Vanonus*).

*Diagnosis.* Eyes unusually small, separated by ca. 60% of head width. The most notable differences from *vigilans* are the smaller eyes and the larger brush on the female hind femora. The eyes are narrower ( $0.22 \times 0.14$  mm or 64% as wide as high in female, against 82% as wide as high in *vigilans* female) and less protuberant (width across eyes 108% of width behind eyes against 112% in *vigilans* female; 106% against 122% in male). The difference in the eyes also shows up in width across eyes against width of prothorax (108% and 112% in females, 106% and 128% in males). Hind femora of female with posterior tooth in apical  $\frac{1}{4}$ , ending distinctly before apex of femur, and with some setae extending beyond apex of tooth. A female with hind femora 0.52 mm long has the brush from 0.37 to 0.46, with the peak at 0.44; femora 0.11 mm wide at base of brush, 0.17 at peak, including brush. Prothorax broadest at or behind middle. Separation of eyes 42%, length of antennae 158% of head width in male, 60% and 158% in female. Length 1.74, width 0.74 mm, elytra 1.39 (1.22-1.43) mm long.

*Distribution.* Southeastern Canada and adjacent States of the U.S.A. from Maine to Wisconsin. Canada: New Brunswick: Bathurst, Penobosquis. Nova Scotia: Cape Breton: Boisdale. Ontario: Arnprior, Carp, Trenton. Quebec: Ile de Montreal, Kazubazua, Laniel, Mt. Lyall—1,500'. U.S.A.: Maine: Dennistown, Mt. Katahdin. Michigan: Marquette. New Hampshire: Mt. Washington (Lake of the Clouds—5,000'). Wisconsin: Bayfield (Casey, 1895, *wickhami*, *lacustris*) (CNCI, MCZC, UAIC, USNM).

Calvescens-Group

*Diagnosis.* A single, relatively large, dark species, with sparse pubescence and distinctive strong microreticulation on head and elytra. Male with head strongly flattened on front, and with the separate parameres of the genitalia short and stout.

*Vanonus calvescens* Casey

*Vanonus calvescens* Casey 1895:793. [Described from "northeastern Wisconsin." Holotype: female, in Casey Coll., USNM, labeled "Wis. / Type USNM 36501 / calvescens Csy.," examined.] Casey, 1905:162.

*Diagnosis.* Brown, head slightly darker, appendages paler. Head very strongly, elytra strongly microreticulate, pronotum smooth between distinct punctures; with moderately sparse short, appressed setae and no interstitial setae. Front of male head strongly flattened, even slightly concave, with thick vertex. Separation of eyes 42%, length of antennae 158% of head width in male, 53% and 156% in female. Length 2.31, width 0.96 mm, elytra 1.81 (1.50–1.81) mm long.

A female 2.31 mm long has head 0.39 long, 0.59 wide across eyes, 0.39 behind, the part behind eyes very short, 0.04 mm. Punctures 0.02 mm center to center; microreticulation lacking for a short distance on midline. Antennae moderately stout, 0.81 mm long, segment 10 0.07 × 0.07 mm; segments 1–5 distinctly microreticulate. Last segment of maxillary palpi an isosceles triangle, 0.19 mm across apex. Prothorax 0.48 mm long, 0.52 wide across base, 0.56 maximum, ca. 0.43 across apex, which lacks collar. Antebasal transverse depression weak. Elytra 0.70 mm wide at distinct humeri, 0.96 maximum; punctures 0.02 mm center to center, setae 0.04 mm, appressed, tactile setae suberect, 0.03.

*Distribution.* Quebec to Pennsylvania, west to Wisconsin. Canada: Quebec: Knowlton, Ste.-Foy. U.S.A. : Maine: Lincoln. New Hampshire: Carroll Co., The Bowl, 2.5 mi NW Monalancet; Mt. Washington. New York: Catskill Mts. Pennsylvania: Jeanette. Wisconsin: northeastern (Casey, 1895). Eight specimens seen, 3 males and 5 females, 5 taken in July, 1 in August (CCHC, CNCI, CUIC, DENH, ICCM, UAIC, USNM).

#### Piceus-Group

*Diagnosis.* Rather slender, sparsely pubescent dark beetles in which both sexes have an elongate brush of dense setae on the posterior side of the hind femora. Prothorax broadest in basal half, with a distinct antebasal transverse depression, its midpoint curved back into a blunt peak at middle of base. Very similar to Wickhami-Group but the male of the only known species differs in having the head strongly flattened on front; the female has a distinctive conformation of the femoral brush. The most striking difference, however, is that the male genitalia lack parameres. Assignment to *Vanonus* is therefore provisional.

#### *Vanonus piceus* (LeConte)

Figs. 50, 57

*Xylophilus piceus* LeConte 1855:276. [Described from “Middle and Southern States.” Lectotype, new designation, female, in LeConte Coll., MCZC, labeled “pink disk / piceus 5.” It is in a series headed by a female lacking hind legs and labeled “Louisian. / Type 4887 / X. piceus Lec.” This designation restricts the type-locality to “Middle States.”] ?Casey, 1895:794 (*Vanonus*).

*Xilophilus* [sic!] *tuberculifer* Hamilton 1893:279. [Lectotype, new designation, male, in Hamilton Coll., ICCM, labeled “Severn, Ont., tuberculifer / Carn. Mus. Acc. 519” and bearing my lectotype label, examined.] Casey, 1895:794, and 1905:162 (*Vanonus*), at least in part. **New synonymy.**

*Vanonus fusciceps* Casey 1905:163. [Holotype, female, in Casey Coll., USNM, labeled “N.Y., with an ink line under the Y / Type USNM 36504,” examined.] **New synonymy.**

*Vanonus congener* Casey 1905:163. [Holotype, female, in Casey Coll., USNM, labeled "Bayfield, Wis., Wickham / Type USNM 36503," examined.] **New synonymy.**

*Diagnosis.* Brown, appendages tending toward reddish, head darker than body in paler individuals; shiny with sparse, fine appressed setae and interstitial setae on elytra, the latter about as numerous as the setae and equal in length; both kinds inconspicuous. Male with front of head almost completely flat from frontoclypeal suture to vertex, which is quite thin (Fig. 5). Front with evenly spaced, moderately dense, fine punctures and no obvious pubescence. Female head normal. Male antennae moderately slender. Separation of eyes 56%, length of antennae 181% of head width in male, 48% and 152% in female. Length 1.44, width 0.70 mm, elytra 1.07 (1.07–1.50) mm long.

Male hind femora with long brush as in males of the Wickhami-Group. Female hind femora with a similar brush of long setae from basal  $\frac{1}{2}$  to near apex, the setae gradually increasing in length from base to an obtuse peak at basal  $\frac{1}{3}$ , gradually decreasing from there to apex (Fig. 57). Eyes slightly smaller and antennae heavier than in male.

*Distribution.* Ontario to Iowa, south to Florida and eastern Oklahoma. Canada: Ontario: Sparrow Lake (Hamilton, 1893, *tuberculifer*). U.S.A. : Alabama: Spades Mountain. Florida: Gainesville, Torreya State Park. Iowa: Keokuk. Maryland: College Park, Sparrows Point. Massachusetts: Framingham, Wayland. New Hampshire: 4 mi W Durham. New York: "near the city" (Casey, 1895, *fusciceps*). Oklahoma: Latimer Co. Pennsylvania: Allegheny, Jeannette, Pittsburg, St. Vincent. Virginia: Penington Gap. West Virginia: Guthrie. Wisconsin: Bayfield (Casey, 1895, *congener*) (DENH, FMNH, FSCA, ICCM, GHNC, MCZC, MCTC, PSKC, UAIC, USNM, WSCC, WVDA).

#### Uniformis-Group

*Diagnosis.* A single species in eastern North America, but additional undescribed species in the Southwest. Differs from other groups in having long and slender antennae, a shiny surface lacking interstitial setae, and pronotum lacking any indication of an antebasal transverse depression.

#### *Vanonus uniformis*, new species

Fig. 3

*Diagnosis.* Brown, elytral humeri obscurely paler, shiny, appendages light tan, middle and hind femora dusky. Separation of eyes 26%, length of antennae 200% of head width in male; female unknown. Length 1.63, width 0.78 mm, elytra 1.28 (1.13–1.28) mm long.

*Description.* Holotype, male: head 0.33 mm long, 0.50 wide across eyes, 0.31 just behind; eyes 0.28 × 0.22 mm, separated by 0.13 (26% of head width), overlapping hind margin of head. Front evenly convex, with distinct punctures and fine, appressed setae, the intervals smooth. Antennae long, all segments but second longer than wide. Last segment of labial palpi strongly transverse. Prothorax subquadrate, 0.35 mm long, 0.43 wide at base, sides nearly parallel to 0.28; moderately densely, distinctly punctured, without antebasal transverse depression. Elytra 0.59 mm wide across

distinct humeri, 0.78 maximum. Surface very distinctly punctured, the punctures ca. 0.03 mm center to center in basal fourth, to ca. 0.02 mm and almost touching behind; intervals smooth and shiny; setae decumbent, ca. 0.04 mm, slightly curved and almost touching surface. Omoplates and postbasal transverse impression feeble. Hind femora 0.44 mm long, 0.06 wide at base to 0.12 maximum wide, with a brush 0.04 mm wide from apex of trochanter at 0.06 to 0.39. Female unknown.

*Specimens examined.* Florida to Arkansas. Holotype: male, Gainesville, Fla., VI-20-64, R. E. White, in FSCA. Paratypes: 1 male, Florida: Jackson Co., Florida Caverns St. Pk., 19-V-1983, E. G. Riley & D. A. Rider, Riley Coll. 1 male, Florida: Gainesville, R. E. Woodruff, 3-VIII-1971, at *Liquidambar styraciflua*, FSCA. 1 male, Alabama: Jefferson Co., Westview, VI-14-1974, T. King L. T., UMRM. 1 male, Arkansas: Newton Co., 9 mi W Jasper, 23.IX.1983, 1,000', veg. nr. river, J. Pakaluk #204, SEMC (EGRC, FSCA, SEMC, USNM, WSCC).

#### Balteatus-Group

*Diagnosis.* A single species separated on the basis of contrasting markings on the elytra, in the moderately dense pubescence. Presence of the species at Brownsville, Texas may indicate a more tropical distribution than for the other groups.

#### **Vanonus balteatus**, new species

Fig. 4

*Diagnosis.* Bright tan with dark brown head and light brown midband on elytra, also sides of elytra from humeri to midband in one individual, in cuticle and moderately dense pubescence. Abdomen brownish in some. Hind femora with a strong, shiny black brush for most of the length. Separation of eyes 19%, length of antennae 168% of head width in male; female unknown. Length 1.93, width 0.85 mm, elytra 1.50 (1.35–1.70) mm long.

*Description.* Holotype, male: head 0.35 mm long, 0.57 wide across eyes, 0.31 just behind; eyes large, 0.31 × 0.23 mm, separated by 0.11, eyes to base of head 0.02 mm. Setae on eyes short and inconspicuous. Antennae 0.96 mm long, segment 11 0.09 thick. Prothorax 0.44 mm long, 0.47 wide, the sides subparallel but slightly sinuous, both front and hind angles nearly quadrate. Elytra 0.61 wide at points of humeri, 0.85 maximum, with brown band 0.59–0.93 mm from base behind humeri, 0.68–0.87 in middle, 0.70–1.02 near suture. Setae 0.05 mm, decumbent, interstitial setae almost equal, 0.04 mm, tactile setae erect, inconspicuous, 0.03 mm. Hind femur 0.52 mm long, with brush from 0.09 to 0.44, 0.06 mm wide, but with some pale setae on femur next to it that may also be part of brush. Last fully visible tergum and sternum with apex evenly rounded, not evenly beaded, pygidium small.

*Specimens examined.* Isolated localities from southern Texas to eastern Kansas. Holotype: male, Oklahoma: Marshall Co.: UOBS, Lake Texoma (Willis), 7.VII.1968, leg. W. Suter, at light, in FMNH. Paratypes: 1 male, same data but 3.VII.1968. 1 male, Brownsville, Texas, 12/10.1911, E. G. Smyth coll., Ser. No. 177. 1 sex?, Ft. Sam Houston, San Antonio, Texas, V-14-16-1945, light trap, D. E. Hardy. 1 male, Kansas: Douglas Co., Breidenthal Res., 2 mi N Baldwin, 2.IX.1983, UV light, J. Pakaluk (FMNH, SEMC, WSCC).

SUBFAMILY II

*Diagnosis.* Male genitalia without separate parameres. Interstitial setae present or absent. Hind femora either without a brush in either sex, with a very reduced posterior brush in both sexes, or with an extensive pad of modified "setae" in male only.

Subfamily II, Tribe 1

*Diagnosis.* Last visible sternum of female without a median pit. Hind femora either without a brush or with a very reduced brush in both sexes.

*Aderus* Westwood

*Aderus* Westwood 1830:58 (type-species: *Lytta Boleti* Marsham, =*Notoxus populneus* Panzer, by monotypy and original designation).

*Phomalus* Casey 1895:785 (type-species: *Xylophilus brunnipennis* LeConte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:28. **New synonymy.**

*Diagnosis.* Unique in the Nearctic fauna in that antennal segment 3 is much shorter than segment 4, subequal to segment 2. Pubescence dense, the interstitial setae longitudinal. Hind femora without a brush in either sex. Widespread in the Palearctic Region and other areas, including a few species in South America.

*Discussion.* Two species seen from south Texas are not included in the key. Both have dark heads and hind femora. One, a male from San Antonio, Bexar Co. (V-20-58, J. F. Lawrence, MCZC) is probably *Aderus saginatus* (Casey) [1895:787]—NEW COMBINATION—an abundant species in southwestern U.S.A. This species has the elytra entirely pale and the male antennae longer and heavier than in the female. The San Antonio specimen has antennae 220% as long as head width, comparable to males from Arizona.

The other species has a brown midband on the elytra. I am assigning it provisionally to *Aderus tantillus* (Champion)—[1890:190, pl. 8, fig. 28]—NEW COMBINATION. This species was described from a single male 1.5 mm long, from San Geronimo, Guatemala. The figure shows the same kind of brown band on the elytra, but both figure and description indicate pale hind femora. One Texas specimen, a male from Cameron Co. (Sabal Palm Grove Sanct., near Southmost, V-18-79, E. G. Riley, EGRC), is 1.55 mm long. The other, a female from San Patricio Co. (Weller Wildlife Ref., 8 mi NE of Sinton, 15 May 1985, Paul K. Lago, UMIS), is larger, 2.01 mm.

Key to Species

- 1. Hind femora contrastingly darker than others, darker than hind tibiae and often hind trochanters; other femora concolorous with rest of body or paler. Head dark. Strongly marked individuals with a brownish posthumeral zone on elytra, and a more extensive but paler zone in basal half that encloses oval pale lateral marks and less distinct pale marks on omoplates ..... *Aderus brunnipennis*
- Hind femora pale, not darker than others or hind tibiae or trochanters. Head pale, brownish in the darkest individuals. Elytra of strongly marked individuals with pale brown pubescence in a W-shaped marking behind omoplates, in a broad postmedian band, and at apex, these markings inconspicuous at best ..... *Aderus populneus*

*Aderus brunnipennis* (LeConte), **New Combination**

Figs. 10, 65

*Xylophilus brunnipennis* LeConte 1875:176. [Described from "S. Carolina, (Zimmermann); Illinois, (Walsh); Texas, (Belfrage)." Lectotype, new designation, in LeConte Coll., MCZC, labeled "S.C. / X. brunnipennis Zimm." LeConte apparently used a Zimmermann manuscript name and underlined Zimm. to indicate that he had used the specimen in his description.] Casey, 1895:786 (*Phomalus*). Not Hatch, 1965:129 (*Phomalus*).

*Diagnosis.* Tan to brown, head and hind femora very dark, sometimes almost black, prothorax nearly as dark, antennae and rest of legs pale. Pubescence dense, appressed, pale tan, with a gray and tan pattern on elytra, there tan to dark tan in postbasal transverse impression and along suture to base, often leaving an ill-defined pale spot on each omoplate and another longitudinally oval spot on side at basal  $\frac{2}{5}$ . These are most noticeable in clean, dark specimens, lighted from front. Separation of eyes 26%, length of antennae 189% of head width in male, 38% and 190% in female. Length 1.87, width 0.84 mm, elytra 1.46 (1.24–1.54) mm long.

*Distribution.* Florida to eastern Texas, north to Pennsylvania and Kansas; Cuba in the West Indies. Alabama: Birmingham. Arkansas: Fulton Co., Jackson Co. District of Columbia: Washington. Florida: Archbold Biological Station, Collier Co., Dade Co., Daytona, Highlands Hammock, Indian River Co., Marion Co., Suwanee Co. Illinois: Fayette Co. Indiana: Bear Wallow, Evansville, Grantsburg, Indianapolis, Tippecanoe Co. Kansas: Lawrence. Kentucky: Perryville. Louisiana: Clinton, Sabine Parish. Maryland: Colesville, College Park. Missouri: Columbia, Creve Coeur Lake, Moberly, Raytown, Reynolds Co., St. Charles, St. Louis. North Carolina: Chapel Hill, Duke Forest. Ohio: Cincinnati. Oklahoma: Latimer Co., Pearson. Pennsylvania: Allegheny Co., Jeannette. Texas: Brownsville, Gonzales Co. (Palmetto State Park), Jefferson. West Virginia: Charleston, Guthrie. West Indies: Cuba: Guantanamo Bay (U.S. Naval Station), Soledad (near Cienfuegos) (CDAE, CNCI, CUIIC, DENH, FMNH, FSCA, GHNC, ICCM, KSTC, LSUC, MCTC, MCZC, MUIIC, SEMC, UAIC, UMRM, USNM, WSSC, WVDA).

*Aderus populneus* (Panzer)

Fig. 11

*Notoxus populneus* Panzer 1796:vol. 35, no. 4. [Described from Europe. Location of Panzer specimens unknown to author.] Baguena, 1948:277 (*Aderus*). Baguena and some other authors attribute the species to "Creutzer in Panzer."

*Phomalus brunnipennis*: Hatch 1965:129 (misidentification).

*Diagnosis.* Tan, head and abdomen slightly darker, palpi and legs paler. Pubescence dense, appressed, pale with obscure brownish pattern in elytral setae but not cuticle: a rough V-mark behind each omoplate, from 0.19 mm from base at sides, 0.20 near suture, 0.28 between, and back to 0.46; a band starting at 0.56 mm at sides, nearly transverse to middle, then offset backward to 0.70 from there to suture, its hind margin diagonal and extending back to 0.98; and a terminal zone from 1.39 mm to apex at 1.48. Separation of eyes 26%, length of antennae 259% of head width in male, 36% and 197% in female. Length 1.91, width 0.83 mm, elytra 1.48 (1.48–1.83) mm long.

*Distribution.* Quebec to British Columbia, south to Indiana and Iowa in East, northern Utah, and California on the Pacific Coast. Canada: British Columbia: Creston, Royal Oak (both from Hatch, 1965). Ontario: Ottawa, Pelee Island, Prince Edward Co. Quebec: West Brome. U.S.A.: California: Sacramento. Idaho: Nez Perce Co. (Juliaetta Falls). Illinois: Cornell. Indiana: Grantsburg, Tippecanoe Co., Vera. Iowa: Ames, Iowa City. New Hampshire: Lee. Ohio: Holgate. Oregon: Jackson Co. (Siskiyou Mts.), Lane Co., McMinnville (from Hatch, 1965). Utah: Logan. Washington: Whitman Co. Wisconsin: Milwaukee. The earliest North American records seen are Iowa City, Iowa (1934), Pelee Island, Ontario (1940), and Holgate, Ohio (1941) (CDAE, CNCI, DENH, FMNH, FSCA, MCZC, NMDC, UAIC, WSCC).

*Emelinus* Casey

*Emelinus* Casey, 1895:777 (type-species: *Xylophilus Melsheimeri* LeConte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:36.

*Diagnosis.* Moderately slender, sparsely pubescent species, lacking interstitial setae. Color primarily in cuticle. Males with antennal segments 4–10 flabellate, and legs unmodified. Females differ from *Zonantes* females in that they lack a pit on the midline of the last visible abdominal sternum. Two additional species in the Southwest, others in the Neotropical Region.

*Emelinus melsheimeri* (LeConte)

Figs. 12, 13, 18

*Xylophilus Melsheimeri* LeConte 1855:275. [Described from "York county, Pennsylvania; Messrs. Melsheimer & Ziegler." Lectotype, new designation, male, in LeConte Coll., MCZC, labeled "pink disk / melsheimeri 2," examined.] Casey, 1895:778 (*Emelinus*). Werner, 1960:36 (*Emelinus*).

*Emelinus ashmeadi* Casey 1895:778. [Holotype, male, labeled "Tampa, Fla, 12.4 / Type USNM 36499 / subtropicus Csy," in Casey Coll., USNM, examined by D. S. Chandler.] **New synonymy.**

*Diagnosis.* Tan with zig-zag pattern of dark markings on elytra, mainly in cuticle. Separation of eyes 3%, length of antennae 249%, rami 155% of head width in male; 29% and 188% in female. The eyes of males are large and nearly contiguous in all southern specimens, smaller and more widely separated toward the northern edges of the range. A male from northern Illinois has the separation of the eyes 17% of head width. Length 2.20, width 0.84 mm, elytra 1.66 (1.50–1.90) mm long.

*Distribution.* Florida to northeastern Mexico and eastern Arizona, north in East to Illinois and Massachusetts. U.S.A.: Alabama: Chickasaw. Arizona: Chiricahua Mts. (Werner, 1960). Florida: Devil's Millhopper State Park, East Point, Gainesville, Highlands Hammock, Hillsboro River State Park, St. Nicholas (Casey, 1895, *ashmeadi*), Torreya State Park. Illinois: Clark Co., LaSalle Co. Indiana: Clarke Co., Eddyville, Marion Co., Tippecanoe Co. Louisiana: Jackson, Opelousas. Maryland: College Park, Great Falls of Potomac River, Greenbelt. Massachusetts: Tyngsboro. Missouri: Ashland, Columbia, Fulton, Moberly. New Jersey: Highlands. New York (state label). Ohio: Delaware Co., Franklin Co., Greene Co. Oklahoma: Latimer Co.

Pennsylvania: Allegheny, Castle Rock, Jeannette, Neversink, Pittsburg, York Co. (LeConte, 1855). South Carolina: Florence, Liberty Hill, Pineville, Summerville. Texas: Gillespie Co. West Virginia: McClintick Wildlife Sta. Mexico: San Luis Potosi: Tamazunchale (CDAE, CNCI, CUIC, EGRC, FMNH, FSCA, GHNC, ICCM, KSTC, MAIC, MCTC, MCZC, NMDC, OSUC, PSKC, SEMC, VMKC, UAIC, UMRM, WSCC, WVDA).

*Cnopus* Champion

*Cnopus* Champion 1893:460 (type-species: *Cnopus flohri* Champion, by monotypy). Casey, 1895:802. Pic, 1905:237, 245. Baguena, 1948:76.

*Diagnosis.* Small, delicate, sparsely pubescent species, lacking interstitial setae. Segment 1 of hind tarsi shorter than segments 2–4 combined. Basal third of pronotum with a conspicuous deep transverse depression, moderately sharply defined, deeper laterally. Males with longer antennae than females, otherwise barely distinguishable. Additional species in the Southwest, and at least one species in the desert region of northern Argentina. Both sexes may be frequent at light.

*Cnopus impressus* (LeConte)

Fig. 14

*Xylophilus impressus* LeConte 1875:175. [Described from "Texas, Belknap." Gustav Wilhelm Belknap collected in eastern Texas, and lived longest at Waco. Lectotype, new designation, female in LeConte Coll., MCZC, labeled "Tex. / X. impressus Lec., with "Lec." underlined / Type 4888," examined.] Casey, 1895:803 (*Cnopus*).

*Diagnosis.* Head dark brown, prothorax and appendages pale, rest reddish brown; varying through prothorax no paler than elytra to all dark brown with reddish appendages. Separation of eyes 43%, length of antennae 186% of head width in male, 48% and 150% in female. Length 1.19, width 0.54 mm, elytra 0.85 (0.74–1.11) mm long.

*Distribution.* Florida to eastern Texas, north to Missouri. Alabama: LeRoy, Walker Co. Arkansas: Fulton Co., Polk Co. Florida: Camp Mahachie, Gainesville, Homestead, Monroe Co. (Upper Key Largo), Rainbow Springs, Torreya State Park. Louisiana: Baton Rouge, Natchitoches Parish. Missouri: Boone Co., Moberly. Mississippi: Jackson Co. (Gulf Islands National Seashore), Tishomingo Co. Oklahoma: Latimer Co. Texas: (LeConte, 1875) (CNCI, CUIC, DENH, EGRC, FSCA, KSTC, LSUC, MCTC, MCZC, MUIC, UAIC, WSCC).

*Axylophilus* Casey

*Axylophilus* Casey 1895:808 (type-species: *Axylophilus yuccae* Casey, by monotypy).

*Diagnosis.* Despite its unusual features, this genus is properly placed in the family Aderidae. The tarsal formula is 5-5-4; the antepenultimate segment of each tarsus is lobed; and the first two exposed abdominal sterna are fused (Fig. 54). The conformation of the head and mouthparts (Fig. 49) is different from any seen in any other Aderidae.

The whole base of the head, from vertex laterally to the genae, is apparently a thin

lamina that abuts the front of the pronotum almost perfectly. The whole frons is swollen from the deeply emarginate eyes and bases of the antennae to the deep frontoclypeal suture, 0.21 mm wide, ca. 0.13 mm long. Lateral to the frons there is a narrow elevated strip from front of eye to base of mandible. The clypeus is small and flat, 0.07 mm long, 0.09 wide, and the labrum quite normal, 0.05 mm long, 0.08 mm wide, with a slight notch at the middle. The mandibles are extraordinary, and certainly do not look like mandibles in Figure 4. The whole front face is a plate and the combined mandibles form a slightly bulged plate 0.17 mm wide, 0.07 mm long, its side margins thin and almost evenly curved. Not visible in Figure 4 but evident in a slide preparation is the fact that the mandibles meet in a straight line down the middle of this plate, each of them having about 8 tiny teeth in this location. The other mouthparts seem more or less normal, but are difficult to see in the available specimen. The last segment of the maxillary palpi is in the form of an almost perfectly isosceles triangle with apex at attachment, and the last segment of the labial palpi is very small, almost circular.

*Axylophilus yuccae* Casey

Figs. 49, 54

*Axylophilus yuccae* Casey 1895:809. [Lectotype, new designation, male, labeled "Crescent City Fla (10 3 on underside) / nov. gen. Chamacropis S3+ / Type USNM 36494 / *Axylophilus yuccae* Csy," in Casey Coll., USNM, examined.]

*Diagnosis.* Shiny, moderately deeply punctured, with short appressed primary setae, no interstitial setae, brown with dull yellow marking dorsally. Lectotype male: length 1.04, width 0.57 mm, 0.49 mm thick at metasternum, elytra 0.78 (0.76–0.78) mm long. Head and pronotum dull yellow; scutellum brown; elytra brown with dull yellow markings at base to 0.07 mm at humeri, 0.17 near suture; in an interrupted midband 0.22 to 0.35; and interrupted subapical band, 0.56 to 0.65; pale markings not reaching side margins. Appendages yellow, the femora brownish across middle. Antennae slender, 0.63 mm long. Antennae arising near edge of deep excavation of eyes. Middle lobe of eyes 0.06 mm wide, narrowest part at back 0.04. Length of antennae 189%, separation of eyes 21% of head width. Last visible sternum not modified, with evenly curved apex. Aedeagus slender and straight-sided, protruding part 0.26 mm long, 0.05 wide; a slender structure, almost as long as aedeagus and apparently sclerotized, protruding from its apex.

*Distribution.* Known only from specimens collected on the east coast of Florida by Hubbard and Schwarz: Palm Beach Co. (Cape Jupiter, 10 May) and Putnam Co. (Crescent City, 24 April). Casey (1895) indicates that they were abundant on plants of a species of *Yucca* (FSCA, USNM). Lectotype and 2 specimens in FSCA seen.

*Ariotus* Casey

*Ariotus* Casey 1895:788 (type-species: *Xylophilus quercicola* Schwarz, new designation). Pic, 1905:235 (subgenus of *Hylophilus*).

*Scanylus* Casey 1895:800 (type-species: *Scanylus pruinus* Casey, =*Hylophilus caseyi* Pic, by original designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:96. New synonymy.

*Diagnosis.* As here redefined, *Ariotus* is unique in the Nearctic fauna in having a single row of short, erect setae on the hind margin of the hind femora. The brush may be limited to the basal third or extend as far as the apex; it is usually more strongly developed in the male. The brush found on the hind femora of other genera is always more than one seta thick. Another distinctive feature is the shape of the prothorax, which tends to be broadest and slightly angular near the front and slightly constricted at the middle of the sides, with weak depressions onto the disc from the constriction (Fig. 22). Pubescence moderately dense, appressed. Probably a largely Neotropical genus. One described and several undescribed species in the southwestern U.S.A.

#### Key to Species

1. Uniformly light to dark brown, without any darker markings. Brush on hind femora nearly complete in both sexes, with a slight break at basal third. (Fig. 63) .....  
     ..... *Ariotus luteolus*
- Elytra pale with brown markings in both cuticle and pubescence. Brush on hind femora of variable length, not interrupted at basal third ..... 2
- 2(1). Antennae pale with segment 11 contrastingly darker. Elytra with dark markings at base, middle and apex. Male sternum 8 with only a V-shaped excision .....  
     ..... *Ariotus quercicola*
- Antennal segment 11 not contrastingly darker than rest. Elytra dark across midzone, sometimes on omoplates. Male sternum 8 bilobed, the lobes flat, pubescent on front face ..... *Ariotus subtropicus*

#### *Ariotus luteolus* (Casey), New Combination

Fig. 63

*Scanylus luteolus* Casey 1895:801. [Holotype, male, labeled “[Ente]rprise Fla 22 / Type USNM 36512 / luteolus Csy” in Casey Coll., USNM, examined.]

*Diagnosis.* Moderately slender, light to dark brown, antennae, palpi and legs paler. Moderately shiny, with evenly distributed small punctures, deep and round-bottomed, becoming less distinct behind middle of elytra. Both primary and interstitial setae fine and appressed, uniformly dark. Head longer behind eyes than usual, its base truncate and covering prothoracic collar. The row of short setae on the hind femora extends almost the whole length, with a break in the series at basal  $\frac{1}{3}$ . In the male this seems to mark two series, the proximal short and of even length, the distal longer, directed more dorsad, and of a more golden hue. The setae in the female are of almost uniform length and color. Trochanters and tibiae not modified in either sex. Separation of eyes 46%, length of antennae 192% of head width in male, 48% and 212% in female. Length 1.81, width 0.76 mm, elytra 1.37 (1.35–1.44) mm long.

*Distribution.* Florida to eastern Oklahoma, north to New York and Wisconsin. Alabama: Sheffield. Arkansas: Montgomery Co., Waldron. District of Columbia (Ulke Coll.). Florida: Lake Monroe (Casey, 1895), Tall Timbers. Indiana: Tippecanoe Co. Missouri: Steelville. New York (Ulke Coll.). Oklahoma: Latimer Co. Pennsylvania: Pittsburg. Virginia: Penington Gap. Wisconsin: Cedar Lake (DENH, FSCA, ICCM, KSTC, MCZC, UAIC, USNM).

*Ariotus quercicola* (Schwarz)

Figs. 20, 21, 23

*Xylophilus quercicola* Schwarz 1878:371. [Lectotype, new designation, male, labeled "Tampa, Fla 9.4 / Coll. Hubbard & Schwarz / Type! Schwarz / Type No. 4533 U.S.N.M.," examined by D. S. Chandler.] Casey, 1895:788 (*Ariotus*).

*Diagnosis.* Moderately slender, shiny; head brown, prothorax slightly paler, elytra dull yellowish with extensive brown markings; in a specimen with elytra 1.30 mm long they are brown; in adscutellar area to 0.22 mm and almost to humeri, weakly along suture to midband (0.46–0.74 mm), which is narrowly divided from behind at suture and narrowed midway between suture and sides; and broadly at apex (1.11–1.30 mm), with a narrow anterior projection along suture to 0.83 mm from base. Appendages dull yellowish except for antennal segment 11 and all but bases of femora, which are brown. Ventral part of thorax bright reddish brown, abdomen brown. Eyes moderately large, 0.19 × 0.15 mm in male. Separation of eyes 48%, length of antennae 183% of head width in male, 52% and 168% in female. Length 1.78, width 0.67 mm, elytra 1.30 (1.30–1.43) mm long.

Male hind trochanters with a tuft of setae 0.03 mm long and less than 0.02 thick, from near middle; hind femora 0.52 mm long, with a brush of setae ca. 0.01 mm long along hind margin, from apex of trochanter at 0.07 mm from base to 0.37 mm from base, and with an erect tuft of a few 0.02 mm setae at 0.26 mm from base and dorsal to row; middle trochanters with a slightly angular bulge; dorsal part of apex of hind tibiae projecting flatly by ca. 0.04 mm.

Female hind legs different. In a female with hind femora 0.57 mm long there is an extremely narrow brush from apex of trochanter at 0.07 mm to 0.20 mm from base; the hind tibiae have a thin, flat plate 0.09 mm long and 0.04 wide, its apex slightly oblique and pointed posteriorly, on dorsal side of apex; this plate seems to be cuticular.

*Distribution.* Known only from Florida: Alligator Point (Franklin Co.), Gainesville, Hillsboro (Casey, 1895), Jena (Dixie Co.), Orlando, Tampa (Schwarz, 1878) (DENH, EGRC, FSCA, ICCM, MCZC, USNM).

*Ariotus subtropicus* Casey

Figs. 19, 22

*Ariotus subtropicus* Casey 1895:789. [Holotype, female?, labeled "Tampa Fla, 12.4 / Type USNM 36499 / subtropicus Csy" in Casey Coll., USNM, examined by D. S. Chandler.]

*Diagnosis.* Moderately slender; bright tan, head brown and elytra with a slightly postmedian brown band, interrupted at suture and weakened at sides. Eyes large, 0.33 × 0.19 mm in male. Separation of eyes 33%, length of antennae 166% of head width in male, 35 and 169% in female. Length 1.83, width 0.70 mm, elytra 1.35 (1.35–1.54) mm long.

A male with hind femora 0.52 mm long has a narrow brush from 0.07 mm at end of trochanter to 0.28 mm from base; simple front and middle trochanters, and hind tibiae with apex just slightly produced. In the female there is an apical plate on the

hind tibiae, much as in *quercicola* but much smaller,  $0.05 \times 0.04$  mm, and a brush on the hind femora as long as in the male but very feeble.

*Distribution.* Florida, coastal Mississippi, and a state label specimen from Maryland. Florida: Alachua Co., Bradford Co., Putnam Co. (Red Water Lake), Winter Park, Tampa (Casey, 1895). Maryland (Ulke Coll.). Mississippi: Lucedale (CNCI, CUI, FMNH, FSCA, ICCM, UAIC, USNM).

*Pseudariotus* Casey

*Pseudariotus* Casey 1895:790 (type-species: *Pseudariotus amicus* Casey, = *Xylophilus notatus* LeConte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Ba-guena, 1948:28 (subgenus of *Syzeton*).

*Diagnosis.* Species with an elongate pit containing inconspicuous short, erect setae, on ventral surface of hind margin of hind femora of both sexes. Relatively broad, sparsely pubescent, the cuticle rather translucent and thin. A single species in the Nearctic fauna. Pic (1905) assigned some Neotropical species to *Pseudariotus*, but the placement cannot be verified from the descriptions. Specimens assignable to the genus seen from Mexico and the West Indies.

*Pseudariotus notatus* (LeConte)

Figs. 15–17, 55

*Xylophilus notatus* LeConte 1855:276. [Holotype: male, in LeConte Coll., MCZC, labeled “orange disk / Type 4883 / *Xylophilus notatus* Lec., Ga.,” examined.] Casey, 1895:791 (*Pseudariotus*).

*Pseudariotus amicus* Casey 1895:791. [Holotype, female, labeled “Biscayne, Fla 16.5 / Type USNM 36500 / *Pseudariotus amicus* Casey,” examined by D. S. Chandler.]

**New synonymy.**

*Diagnosis.* Shiny, moderately sparsely punctured and pubescent, brown with all appendages paler, a vague lateral zone in postbasal transverse impression and an interrupted postmedian band on elytra yellowish. Some specimens have the pale elytral markings less extensive. Pronotum with a shallow depressed zone before base and another nearly straight zone from side to side at middle, connecting feeble midlateral notches. These depressions have distinct punctures, lacking on their borders. Separation of eyes 37%, length of antennae 167% of head width in male, 42% and 171% in female. Last segment of labial palpi very transverse, 0.05 mm long, 0.15 wide, attached at about the middle. Length 1.46, width 0.73 mm, elytra 1.20 (1.20–1.22) mm long.

Male with first 2 segments of front tarsi swollen and modified (Fig. 55). A male with hind femora 0.44 mm long, 0.15 wide has a pit 0.02 mm wide from 0.11 to 0.30 mm from base, 0.02 mm from hind margin and parallel to it. The pit is inconspicuous because it is filled with setae that match the surface setae. The pit is essentially identical in the female.

*Distribution.* Florida to eastern Oklahoma, north to the District of Columbia. District of Columbia: Washington. Florida: Biscayne Bay (Casey, 1895, *amicus*), Crystal Beach, Hose Sound, Micanopy, Old Town, Torreya State Park. Georgia: Habersham Co. (LeConte, 1855). Louisiana: Baton Rouge. Oklahoma: Latimer Co.

Few specimens have been collected (CNCI, EGRC, FSCA, ICCM, KSTC, MCTC, MCZC, PSKC, UAIC, USNM).

Subfamily II, Tribe 2

*Diagnosis.* Female with pit on midline of last visible sternum. Hind femora either without a brush or with a very extensive pad made up of thick-based, erect, curved "setae," covering most of underside. Interstitial setae present or absent. Two genera, both widespread in the Neotropical Region.

*Zonantes* Casey

*Zonantes* Casey 1895:779 (type-species: *Xylophilus subfasciatus* Leconte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:161 (subgenus of *Syzeton*).

*Diagnosis.* Shiny, often fairly broad species, usually pale with contrasting dark markings in cuticle, bearing sparse setae and no interstitial setae. Male front tibiae at least gently curved and excavated on inside of apical fourth (angularly so in Fasciatus-Group) and terminating in a short spine at inner apex; front trochanters usually bearing a spine; antennae usually longer and more slender than in female; hind femora never with a brush or zone of plush-like pubescence. Female with a small, seta-filled pit on midline of basal half of last visible sternum and usually with small spines directed down from apex of last visible tergum and up from apex of last visible sternum. Female legs unmodified, except for a swelling and apical brush on segment 1 of hind tarsi in *Z. ater*. Well represented in Mexico and Central America, with additional species in at least northern South America.

Key to Species

- 1. Anterior tibiae angularly bowed (male of some species, Fig. 62) ..... 2
- Anterior tibiae straight or evenly curved ..... 4
- 2(1). Posterior femora abruptly expanded dorsally from near middle to apex (Fig. 46).  
See couplet 7 for markings ..... male *Zonantes fasciatus*
- Posterior femora not so expanded ..... 3
- 3(2). Elytra with brown adscutellar zone and broad median band, sometimes broken  
into 2 blotches on each elytron (Figs. 25-27) ..... male *Zonantes hubbardi*
- Elytra all pale across base, dark in a weak, almost transverse postmedian mark,  
interrupted at suture (Fig. 32) ..... male *Zonantes ouachitanus*
- 4(1). Elytra and whole body brown ..... 5
- Elytra all pale or pale with dark markings ..... 6
- 5(4). Eyes deeply excised. First segment of female hind tarsi with an oblique apical brush  
(Fig. 52) ..... *Zonantes ater*
- Eyes shallowly excised. First segment of female hind tarsi simple .....  
..... *Zonantes mississippiensis*
- 6(4). Elytra with broad midband not interrupted at suture ..... 7
- Elytra with at most a midband that is interrupted at suture, or with dark blotches  
or spots in midzone, to entirely pale ..... 8
- 7(6). Midband very broad, its posterior margin not cut into two lobes on each elytron  
(Fig. 24), often continuing forward along suture and merging with broad adscutellar

- zone and scutellum. Last visible abdominal tergum with 3–4 evenly spaced laminar teeth on underside of middle of apex ..... female *Zonantes fasciatus*
- Midband moderately broad, its posterior edge cut into 2 lobes on each elytron, the lateral lobe shorter, often isolated from quadrate dark adscutellar zone and scutellum (Fig. 27). Last visible tergum with 4 ventral laminar teeth on apex, with gap in middle greater than separation of lateral pairs ..... heavily-marked female *Zonantes hubbardi*
- 8(6). With at least some dark marking at base of elytra ..... 9
- Whole base of elytra and scutellum pale ..... 11
- 9(8). Dark marking at base of elytra a small spot centered midway between the pale scutellum and the humerus of each elytron; midzone of each elytron with a pair of sharply demarcated dark spots, the lateral the more anterior (Fig. 38) ..... some *Zonantes signatus*
- Adscutellar area, and usually scutellum dark. Midzone with a dark band, interrupted at suture, the midband sometimes reduced to 2 blotches on each elytron ..... 10
- 10(9). Midzone of elytra with a pair of narrow diagonal dashes, nearly touching at suture at apical  $\frac{2}{3}$ – $\frac{3}{4}$ , their mesal margins directed toward the humeri, with a ca. 30 degree angle between them (Figs. 30, 31). Palest individuals have the dashes connected to the side margin by a dark band from the anterior portion, and have the adscutellar area only vaguely darkened. Darkest individuals with dark elytral markings: sides from middle markings almost to humeri; adscutellar zone and scutellum; an oval to elongate mark in shallow depression posterolateral to omoplates, aligned between dashes and humeri; and sutural cloud behind dashes. Last tergum of female with small ventral teeth all across apex ..... most *Zonantes nubifer*
- Midzone of elytra with a similar pair of narrow dashes, but these less diagonal, the two separated by <10 degrees and the mesal edges oriented toward middle of base (Fig. 25). These may be connected to a lateral dark mark from near the front, and the lateral mark to the margin, but sides not dark much anterior to level of front of dashes. Pronotum usually pale with a pair of dark blotches. Scutellum pale, often flanked by dark spots. Last tergum as described in couplet 7 ..... some female *Zonantes hubbardi*
- 11(8). Pronotum with a pair of dark blotches. Markings otherwise as in couplet 10 ... a few female *Zonantes hubbardi*
- Pronotum entirely pale ..... 12
- 12(11). Moderately slender. Rare species and rare variants of commoner species ..... 13
- Relatively stout species, much more abundant ..... 14
- 13(12). Dark midband weak, transverse, slightly postmedian, and vaguely interrupted at suture (Fig. 32) ..... female *Zonantes ouachitanus*
- Dark midband usually broken into 2 blotches on each elytron, separated at suture by pale zone only slightly wider in front. See couplet 10 ..... a very few female *Zonantes hubbardi*
- Dark midband, sometimes broken into 2 blotches on each elytron, divided at suture by 30 degree triangular zone. See couplet 10 ... a very few *Zonantes nubifer*
- 14(12). Each elytron with 2 small, nearly circular isolated dark spots in midzone, the lateral one the more anterior (Fig. 37). Female with apex of last exposed tergum evenly curved (Fig. 39). Male tegmen moderately slender, tapered to a slender apex ..... most *Zonantes signatus*
- Elytra with dark blotches or a band across midzone, varying to all pale but not with small, isolated round spots ..... 15
- 15(14). Lateral part of dark elytral markings centering slightly posterior to middle of elytron, marking angled backward toward suture, not divided into blotches, but often evanescent, sometimes absent (Figs. 33, 34). Head pale to reddish. Eyes

- unusually small. Female with apex of last exposed tergum evenly curved (Fig. 40). Male tegmen moderately broad, tapered to a slender point . . . . . *Zonantes pallidus*
- Lateral part of dark elytral markings centering very close to midpoint of elytron. Head usually brownish or darker . . . . . 16
- 16(15). Band on elytra consisting of two, usually broadly connected, blotches on each elytron, the one nearer the suture centering slightly anterior to the one nearer the side (Figs. 28, 29). Head usually dark brown. Female with apex of last exposed tergum excavated, bearing moderately strong ventral spines (Fig. 41). Male tegmen slender. Widespread and common . . . . . *Zonantes subfasciatus*
- Band on elytra with lateral blotch centering slightly anterior to one nearer the suture, the blotches almost always separate (Figs. 35, 36). Head slightly darkened but not dark brown. Female with apex of last tergum excavated, bearing strong ventral spines (Fig. 42). Male tegmen spearhead-shaped, with a ventral keel. Florida . . . . . *Zonantes floridanus*

Subfasciatus-Group

*Diagnosis.* Small, rather stout pale species with pale elytra that usually have a band or 4 dark spots in midzone (tiny dark spot also in middle of base in some *signatus*). Male with front tibiae gently bowed and front trochanters bearing a small spine. The 4 known species are easily distinguishable when the dark markings of the elytra are well developed. The tip of the abdomen of the female and the tegmen of the male aedeagus appear to provide reliable characters that can be used for identification of paler individuals.

*Zonantes subfasciatus* (LeConte)  
Figs. 28, 29, 41

*Xylophilus signatus*: LeConte, 1855:276, in part; not Haldeman.

*Xylophilus subfasciatus* LeConte 1875:176. [Described from "Middle, Southern and Western States." Lectotype, new designation, female, in LeConte Coll., MCZC, labeled "pink disk / *X. subfasciatus* Zimm., with Zimm. underlined. This designation restricts the type-locality to "Middle States."] Casey, 1895:782 (*Zonantes*).

*Diagnosis.* Moderately robust, pale but head usually dark, even brown; elytra pale, including base, with a slightly antemedian brown band, interrupted at suture. When this band is broken into 2 spots on each elytron, these are almost always elongate and the lateral one lies slightly behind the median one. Underside pale, hind femora dusky in dark individuals. Separation of eyes 25%, length of antennae 171% of head width in male, 35% and 162% in female. Length 1.50, width 0.79 mm, elytra 1.21 (1.21-1.35) mm long.

Female with apex of tergum 7 excavated, with moderately strong ventral teeth in excavation; apex of sternum 7 evenly curved, with many small dorsal teeth all across and a larger submedian pair. Male front trochanters with a nearly rectangular angulation, ending in a sharp point; tegmen of aedeagus slender.

*Distribution.* Almost always the most abundant aderid in its range, from Florida to eastern Texas and Oklahoma, north to New Hampshire and Wisconsin. Alabama: Mobile Co. Arkansas: Fulton Co., Logan Co., Montgomery Co., Newton Co., Polk Co., Scott Co., Washington Co. Delaware: Long Neck. District of Columbia: Washington. Florida: Alachua Co., Collier Co., Dunedin, Florida Caverns, Gainesville,

Indian River Co., Okaloosa Co., Suwanee Co., Torreya State Park, Walton Co. Georgia: Chatooga Co., Forsyth, Okefenokee Swamp, Tybee Island. Illinois (Ulke Coll.). Indiana: Columbus, Tippecanoe Co. Kentucky: Knox Co., Morehead, Trigg Co. Louisiana: Baton Rouge, Caddo Parish, Feliciana Parish, Opelousas. Maryland: Cabin John, College Park. Massachusetts: Framingham, Hopkinton, Martha's Vineyard, Nashawena Island, Northboro, Sherborn, Tyngsboro. Mississippi: Hancock Co., Louisville, Oktibbeha Co., Richton, Stoneville. Missouri: Columbia, Gasconade Co., Moberly, Portageville, Randolph Co., St. Louis. New Hampshire: Durham. New Jersey: Highlands, Suffolk Co. New York: Bear Mountain, Elbridge, Groton, Long Island (Riverhead, Sea Cliff). North Carolina: Asheville, Balsam, Chapel Hill, Durham, Edgecombe Co., Lake Waccaman, Pollokville. Ohio: Fairfield Co., Greene Co., Hocking Co., Marietta, Pike Co., Scioto Co., Seneca Co., Sugar Grove. Oklahoma: Latimer Co. Pennsylvania: Allegheny, Jeannette, St. Martins. Rhode Island (Casey, 1895). South Carolina: Charleston, McClellanville, Myrtle Beach, Poinsett Beach. Tennessee: Burrville. Texas: Jasper Co. Virginia: Fredericksburg, Hampton, Munden. West Virginia: Guthrie, Mercer Co., Pineville. Wisconsin: Bayfield. (In all collections.)

***Zonantes pallidus*, new species**

Figs. 33, 34, 40

*Diagnosis.* Similar to *subfasciatus* but pale, the head at most reddish tan, and with a slightly postmedian, continuous, oblique, narrow dark band on elytra in most individuals, the lateral part of the band the more anterior; eyes smaller than in other species of group. Separation of eyes 41%, length of antennae 178% of head width in male, 50% and 158% in female. Length 1.65, width 0.81 mm, elytra 1.37 (1.21–1.37) mm long.

Female with apex of tergum 7 evenly curved, with small but visible ventral teeth all across; apex of sternum 7 evenly curved and with many small dorsal teeth all across. Male front trochanters bearing a small, slender spine; tegmen of aedeagus moderately broad, tapered to a slender apex.

*Description.* Holotype: male, 1.65 mm long with head deflexed. Head 0.37 mm long, 0.50 wide across eyes, 0.43 just behind, base behind eyes 0.11 long. Eyes moderately small, 0.26 × 0.17 mm, separated by 0.20. Antennae 0.93 mm long, segment 11 0.07 wide. Prothorax 0.39 mm long, 0.50 wide. Elytra 1.37 mm long, 0.61 wide at points of humeri, 0.81 maximum, the dark band on each at 0.56 to 0.72 mm from base on sides, 0.69 to 0.78 near suture. Setae and tactile setae 0.09 mm long. Of the 28 Latimer Co., Oklahoma individuals, 15 males and 4 females have the elytral band distinct, 4 males and 4 females have it visible but faint, and 1 female has no markings. The head is more reddish in individuals with darker bands. The elytra range from 1.21 to 1.37 mm long in the Oklahoma series, similar to *subfasciatus*.

*Specimens examined.* Eastern Oklahoma and Texas to Florida, north to Ontario and Quebec. Holotype: male, Oklahoma: Latimer Co., 5 mi W Red Oak, VIII-85, Karl H. Stephan/beating low-land forest, in USNM. Paratypes: 27, Latimer Co., Oklahoma. Not designated as paratypes: U.S.A.: Alabama: Mobile Bay (Mobile Co.). Florida: Archbold Biol. Sta. (Highlands Co.), Pt. Orange, Sanford, Tallahassee. Lou-

isiana: Central (E Baton Rouge Par.), Jackson (W Feliciana Par.), St. Tammany Par. Massachusetts: Belchertown, Marion, Martha's Vineyard, Lowell, Natick, Sherborn, Tewksbury, Tyngsboro. Mississippi: Lucedale. Missouri: Ashland Wildlife Refuge (Boone Co.). New Hampshire: Antrim, Durham, Wonalancet (Carroll Co.). Oklahoma: Ada, Hoxbar (Carter Co.), Willis (Marshall Co.). South Carolina: Florence. Texas: Bastrop Co. (Buescher State Park). West Virginia: White Sulphur. Wisconsin: Dane Co. Canada: Ontario: Bark Lake (Renfrew Co.). Quebec: Windsor (CNCI, CUIC, EGRC, DENH, FMNH, FSCA, GHNC, ICCM, KSTC, LSUC, MCZC, NMDC, SEMC, UAIC, USNM, VMKC, WSCC).

Rarest member of the *Subfasciatus*-Group in Latimer Co., Oklahoma but occurs with *subfasciatus* and *signatus* and peaks with them in April/May and August. Apparently not abundant anywhere in its range.

### ***Zonantes floridanus*, new species**

Figs. 35, 36, 42

*Diagnosis.* Similar to *subfasciatus* but pale (head sometimes slightly brownish), and with a pair of moderately small dark spots in midzone of elytra, the lateral spot the more anterior. Separation of eyes 24%, length of antennae 183% of head width in male, 38% and 148% in female. Length 1.63, width 0.85 mm, elytra 1.33 (1.20–1.33) mm long.

Female with apex of tergum 7 strongly excavated, with several strong teeth in excavation and a transverse row of about 5 small ventral teeth anterior to them; apex of sternum 7 with several small and 2 longer submedian dorsal teeth in midzone. Male front trochanters nearly rectangularly produced, the projection ending in a sharp point; tegmen of aedeagus spearhead-shaped with a ventral keel.

*Description.* Holotype: male, 1.63 mm long with head deflexed, elytra 1.33 long. Head 0.35 mm long, 0.54 wide across eyes, 0.43 just behind, base behind eyes 0.05 mm long. Eyes moderately large, 0.26 × 0.22 mm, separated by 0.13. Antennae 0.98 mm long, segment 11 0.08 wide. Prothorax 0.37 mm long, 0.48 wide. Elytra 1.33 mm long, 0.63 wide at points of humeri, 0.85 maximum. The lateral dark spot extends 0.43–0.69 mm from base, 0.30–0.41 from suture; the median spot 0.52–0.74 from base, 0.07–0.19 from suture. Setae and tactile setae 0.09 mm long.

*Specimens examined.* Known only from Florida. Holotype: male, Florida: Dade County, Camp Mahachee, nr. Matheson Hammock, 27-IV-1983, M. C. Thomas & L. Parker, blacklight trap, in FSCA. Paratypes: 6 males, 8 females, same data, from 5-V to 14-IX-1983. Not designated as paratypes: Florida: Alachua Co. (Gainesville), Dade Co. (Everglades Nat. Park, Castellon Hammock), Duval Co. (Jacksonville), Marion Co. (Ocala), Pinellas Co. (Dunedin), Pt. Orange, Steinhatchee R., Tampa (BMNH, CNCI, CUIC, FSCA, MCTC, MCZC, UAIC, USNM).

*Discussion.* Apparently largely nocturnal; of the 35 specimens seen, 18 were taken in a blacklight trap, 1 at light, and 1 female on *Flavoria linearis* in Everglades National Park.

### *Zonantes signatus* (Haldeman)

Figs. 37–39

*Eugenes signatus* Haldeman 1848:97. [Described from "New York, Carolina." Lectotype, new designation, female, in LeConte Coll., MCZC, labeled "orange disk /

3221 / MCZ Type 8388," examined. Since the orange disk indicates "Southern States," the designation restricts the type-locality to "Carolina."] LeConte, 1855: 276, in part (*Xylophilus*). Casey, 1895:781 (*Zonantes*).

*Diagnosis.* All pale, including head; elytra with small, sharply defined, longitudinally oval dark brown spots in midzone, the anterior one sublateral and barely postmedian, the other near the suture and ca. 45 degrees back from the other. Heavily marked individuals have a similar spot in the middle of the base of each elytron. Separation of eyes 25%, length of antennae 171% of head width in male, 35% and 162% in female. Length 1.79, width 0.91 mm, elytra 1.46 (1.28–1.46) mm long.

Female with apex of tergum 7 evenly curved, with very tiny ventral teeth all across; apex of sternum 7 evenly curved, apparently without dorsal teeth. Male front trochanters with a barely visible spine; tegmen of aedeagus moderately slender, tapered to a slender apex.

*Distribution.* Florida to eastern Oklahoma, north to North Carolina and Missouri. Florida: Gainesville, Ocala, Okaloosa Co., Suwanee River State Park, Torreya State Park, Volusia Co., Washington Co. Louisiana: Natchatoches Parish. Missouri: Steelville. Mississippi: Marshall Co. North Carolina: Barnesville, Edgecombe Co. Oklahoma: Latimer Co. South Carolina: Dorchester Co., Florence, Myrtle Beach, Poinsett State Park (CNCI, EGRC, FSCA, GHNC, KSTC, LSUC, MCTC, MCZC, UAIC, VMKC).

#### Nubifer-Group

*Diagnosis.* One moderately slender species, with male front tibiae gently bowed as in *Subfasciatus*-Group, but with a long spine on male front trochanters, and almost always with some dark markings on the base of the elytra in addition to a midzone band.

#### *Zonantes nubifer* (LeConte)

Figs. 30, 31

*Xylophilus nubifer* LeConte 1878:425. [Holotype, female, in LeConte Coll., MCZC, labeled "Enterprise, Fla., 15.6 / 1673 / Type 4882 / X. nubifer Lec., with Lec. underlined," examined.] Casey, 1895:780 (*Zonantes*).

*Diagnosis.* Moderately elongate, usually dark brown and contrastingly pale marked. Antennae, palpi, tarsi and front and middle tibiae pale. Elytra yellowish, dark in a postmedian band, which consists of a pair of oblique dashes at suture, almost meeting behind and set at 30 degrees to each other, connected to sides by a dark band from near front; on sides from midband forward toward humeri, and often in an isolated dash posterolateral to omoplates. Some individuals are less extensively marked, the dash next to the omoplates being the most evanescent. The 30 degree orientation of the separation of the midband at the suture persists even in the least marked individual seen, which is pale across the base of the elytra and has a pale prothorax. Separation of eyes 17%, length of antennae 183% of head width in male, 26% and 155% in female. Length 2.01, width 0.91 mm, elytra 1.50 (1.43–1.53) mm long.

Female with apex of tergum 7 evenly curved, with small ventral teeth all across,

sternum 7 evenly curved, with small dorsal teeth all across. Male front trochanters bearing a slender spine almost as long as trochanter width.

*Distribution.* Florida to eastern Oklahoma and Texas, north to South Carolina. Alabama: Birmingham, Jefferson Co. Arkansas: Polk Co. Florida: Daytona, Dixie Co., Dunedin, Fort Mead, Gainesville, Highlands Hammock, Ocala, Old Town, Putnam Co., Silver Springs, Volusia. Georgia: Pine Mountain (Rabun Co.). Louisiana: Baton Rouge, Feliciana Parish. Mississippi: Richton. South Carolina: Florence, Myrtle Beach. Texas: Montgomery Co. (CNCI, CUIIC, DENH, EGRC, FMNH, FSCA, KSTC, LSUC, MCZC, OSUC, PSKC, SEMC, UAIC, VMKC).

#### Fasciatus-Group

*Diagnosis.* Three North American species in which the males have the front tibiae strongly, angularly bowed in apical fourth. In *fasciatus* there is also a unique expansion of the male hind femora. All have dark markings across the elytral midzone. The females of two species have longitudinal lamellae in the midzone of the underside of the last visible tergum (tergum 7), these appearing as sharp teeth at the apex.

#### *Zonantes fasciatus* (Melsheimer)

Figs. 24, 46, 59

*Xylophilus fasciatus* Melsheimer 1846:55. [Described from "Pennsylvania." Lectotype, new designation, female, in Melsheimer-Ziegler Coll., MCZC, the bottom specimen of a 2-point mount labeled "Melsh. / fasciatus," the species label matching others in the Melsheimer Coll., examined. The lectotype lacks the last 4 segments of both antennae; the top specimen, a male, lacks head and prothorax.] Haldeman, 1848:97 (*Euglenes*). LeConte, 1855:276. Casey, 1895:783 (*Zonantes*). *Zonantes tricuspis* Casey, 1895:784. [Lectotype, female, labeled "Iowa City Wickham / Type USNM 36497 / tricuspis Csy" in Casey Coll., USNM, examined by D. S. Chandler.] **New synonymy.**

*Diagnosis.* Robust, body dark brown to black, elytra reddish but dark brown to black in a well-defined broad midband from side to side, along suture from midband to base and on scutellum and adscutellar area; antennae, palpi and usually all of legs yellowish, even front and middle coxae; hind coxae and sometimes hind femora darkened. Separation of eyes 24%, length of antennae 176% of head width in male, 36% and 183% in female. Length 2.45, width 1.17 mm, elytra 2.01 (1.05–2.01) mm long.

Male front trochanters bearing a strong spine, and hind femora uniquely abruptly expanded on top at about middle and broad from there to end. Female with apex of tergum 7 evenly curved, with fine ventral teeth all across and 3–4 strong lamellate teeth in midzone, these truncate at apex but gently tapered anteriorly.

*Distribution.* Florida to eastern Oklahoma, north to Quebec and Michigan. U.S.A.: Alabama: Cullman Co. Arkansas: Garland Co., Logan Co., Montgomery Co., Newton Co., Polk Co., Scott Co. Connecticut: Cornwall. Delaware: Long Neck, Wyoming. District of Columbia (Ulke Coll.). Florida: Alachua Co., Daytona, Gainesville, Torreya State Park. Georgia: Prattsburg, Rabun Co. Illinois: Coles Co., Downers Grove, Glen Ellyn, Kahokia, Marion Co., Ravina, St. Clair Co., Shelby Co. Indiana: Bear

Wallow, Columbus, Grantsburg, Jefferson Co., Parke Co., Posey Co., Tippecanoe Co. Iowa: Iowa City (Casey, 1895, *tricuspis*), Polk Co. Kansas: Douglas Co., Leavenworth, Onaga. Kentucky: Kentucky Lake State Park, Louisville. Maine: Aurora, Casco, Paris. Maryland: Frederick, Great Falls, Odenton, Silver Spring, Takoma Park. Massachusetts: Ashland, Framingham, Marion, Natick, Sherborn. Michigan: Cheboygan Co., Whitmore Lake. Mississippi: Newton Co., Chickasaw Co., Pontatoc Co. Missouri: Ashland, Barry Co., Columbia, Creve Coeur Lake, Fulton, Gasconade Co., Jackson Co., Lathrop, Madison Co., Moberly, Mound City, New Hartford, Randolph Co., St. Francois Co., St. Louis. New Hampshire: Durham, Stinson Lake. New Jersey: Five-Mile Beach, Highlands, Mountain Lake, Orange Mts. New York: Elbridge, Ollcott, Pike, Southold. North Carolina: Asheville, Balsam, Chapel Hill, Highlands, Macon Co., Weaverville. Ohio: Ashland Co., Clinton Co., Delaware Co., Greene Co., Hocking Co., Scioto, Starke Co., St. Marys. Oklahoma: Latimer Co. Pennsylvania: Allegheny, Harrisburg, Jeannette, Manayunk, Pittsburg, St. Vincent. South Carolina: Florence, Poinsett Beach. Tennessee: East Ridge. Virginia: Hampton, Montgomery Co. West Virginia: Charleston, Grace, Guthrie, Sleep Creek Hunt Area, White Sulphur. Wisconsin: Adams Co., Beaver Dam, Shawane Co. Canada: Ontario: Ad & Lennox Co., Arnprior, Bell's Corners, Gravenhurst, Hastings Co., Leamington, Ottawa, Prince Edward Co., Simcoe, Walsingham. Quebec: Hull, Old Chelsea. (In all collections.)

*Zonantes hubbardi* Casey

Figs. 25–27, 62

*Zonantes hubbardi* Casey 1895:782. [Holotype, male, labeled “Washington DC 13.6 / Type USNM 36495 / hubbardi Csy” in Casey Coll., USNM, examined.]

*Zonantes schwarzi* Casey 1895:783. [Holotype, male, labeled “Biscayne Fla 27.9 / Type USNM 36496 / schwarzi Csy / head & thx missing (Nov. 19-1926) L.L.B.” in Casey Coll., USNM, examined.] **New synonymy.**

*Diagnosis.* Of general aspect of *Z. fasciatus* but less robust. Most eastern Oklahoma and northern individuals have the elytra yellowish with a complete dark midband that is more obviously made up of 2 elongate dashes on each elytron than it is in *fasciatus* and is sometimes interrupted at the suture, and dark in adscutellar area and usually on scutellum. Prothorax usually all dark. Florida populations are generally paler, with head brown, pronotum pale with posterolateral dark blotches, and elytral markings often reduced to 2 isolated dashes in midzone and a small adscutellar zone on each, leaving scutellum pale. Some individuals resemble lightly marked *nubifer*, but differ in having the separation of the midband at the suture nearly parallel-sided. Separation of eyes 14%, length of antennae 174% of head width in male, 28% and 172% in female. Length 2.12, width 1.02 mm, elytra 1.76 (1.35–1.87) mm long.

Male front trochanters strongly spinose, front tibiae angularly bowed, and hind femora simple. Female with apex of tergum 7 slightly excavated, bearing 2–3 long ventral teeth (truncated lamellae as in *fasciatus*) on each side, lateral to excavation, the most mesal the longest; apex of sternum 7 flattened and slightly truncate, with small dorsal teeth all across.

*Distribution.* Florida to eastern Texas and Oklahoma, north to New Jersey and Missouri. Alabama: Birmingham, Helena, Mobile. Arkansas: Hope, Polk Co. District

of Columbia (Casey, 1895, *hubbardi*). Florida: Alachua Co., Archer, Biscayne Bay (Casey, 1895, *schwarzi*), Camp Mahachie, Coronado, Daytona, Dixie Co., Enterprise, Gainesville, Hernando Co., Homestead, Jackson Co., Jim Woodruff Dam, Ocala, Okaloosa, Pensacola, Putnam Co., Rainbow Springs, Salt River, Sebring, Taylor Co., Torreya State Park, Welaka. Georgia: Rabun Co. Indiana: Tippecanoe Co. Louisiana: Baton Rouge, Feliciana Par., Fort Polk, Natchatoches Par., Opelousas, Sabine Par., Vernon Par. Mississippi: Gulfport, Ocean Springs, Starksville. Missouri: Arnold, Boone Co., Columbia, Crawford Co., Danville, Henry Co., Jackson Co., Moberly, New Hartford, Wentzville. New Jersey: Westville. North Carolina: Duke Forest, Raleigh. Ohio: Delaware Co., Franklin Co. Oklahoma: Latimer Co., Summerfield. Pennsylvania: Jeannette. Texas: Karnack, Tatum. Virginia: Great Falls. West Virginia: Charleston, Guthrie (CDAE, CNCI, CUIIC, DENH, FMNH, FSCA, GHNC, ICCM, KSTC, LSUC, MCTC, MCZC, MUIC, NMDC, OSUC, PSKC, UAIC, UMRM, USNM, WSCC, WVDA).

***Zonantes ouachitanus*, new species**

Fig. 32

*Diagnosis.* Moderately slender, pale with darker head and a weak, nearly transverse postmedian dark band on elytra, isolated on each elytron in the known individuals; male front tibiae angularly bowed and hind femora simple. Eyes smaller than in *hubbardi*. Separation of eyes 42%, length of antennae 187% of head width in male, 39% and 170% in female.

Female with apex of last visible tergum evenly curved, bearing 5–6 slender, non-laminar, ventral teeth on each side of a median gap, longest, ca. 0.03 mm, near middle; apex of last visible sternum also evenly curved, with 5–6 similar dorsal teeth on each side of a wider gap, the lateral teeth longer. Length 2.05, width 0.91 mm, elytra 1.69 (1.35–1.69) mm long.

*Description.* Holotype, male: 2.05 mm long with head deflexed; head 0.44 mm long to frontoclypeal suture, 0.64 wide across eyes, 0.56 behind, base 0.09 mm long behind eyes. Eyes 0.30 × 0.27 mm, separated by 0.25 mm. Antennae 1.20 mm long, segment 11 0.09 wide. Prothorax 0.50 mm long, 0.59 wide; elytra 1.69 mm long, 0.76 wide at points of humeri, 0.91 maximum, with band from 0.80 to 1.00 mm from base, weakly divided at suture, not reaching side margins. Elytral setae 0.11 mm long, tactile setae 0.09. Front trochanters with a short, acutely triangular spine ca. 0.04 mm long; front tibiae 0.30 mm from base to sharp curve, ca. 0.19 from there to apex.

*Specimens examined.* Eastern Oklahoma. Holotype: male, Oklahoma: Latimer Co., IX-1983, K. Stephan, in USNM. Paratypes in FSCA, FMNH. Paratypes: 5 males (IX-83, VIII-87, IX-88, in blacklight trap); 1 female, Oklahoma: McCurtain Co., Beaver Bend St. Park, 1 Sep. 1960, at light, W Suter, FMNH (FMNH, FSCA, KSTC, UAIC, USNM).

Ater-Group

*Diagnosis.* A single dark species that has no contrasting markings. The male has the front tibiae gently bowed and spinose at the apex, but lacks a spine on the front trochanters. The female is unique in having a brush on the apex of the first posterior

tarsomere. *Zonantes mississippiensis* is placed here provisionally. It is dark like *Z. ater*, but the female lacks the modification of the hind tarsi and the male is unknown.

*Zonantes ater* (LeConte)

Fig. 52

*Xylophilus ater* LeConte 1875:175. [Described from "Texas, Belfrage." Holotype, sex?, abdomen and hind legs hidden in glue, in LeConte Coll., MCZC, labeled "Tex / 570 / Type 4881 / X. ater Lec., with Lec. underlined," examined.] Casey, 1895:785 (*Zonantes*).

*Diagnosis.* Brownish black with reddish brown antennae, palpi and legs; of general form of *fasciatus*, which is much more abundant. Separation of eyes 32%, length of antennae 215% of head width in male, 35% and 164% in female. Length 2.63, width 1.17 mm, elytra 2.05 (1.87–2.12) mm long.

Apex of segment 1 of female hind tarsi slightly swollen and bearing a diagonal brush of setae on side facing body (Fig. 7). Apex of female tergum 7 evenly curved, with small ventral teeth all across; apex of sternum 7 evenly curved, with sparse small dorsal teeth all across.

*Distribution.* Louisiana and Texas to Ohio and Illinois. Illinois: Lincoln Trail State Park. Indiana: Bear Wallow, Brown Co., Tippecanoe Co. Louisiana: Feliciana Parish, Natchatoches Parish. Missouri: Lee's Summit. Ohio: Highlands Co. Oklahoma: Latimer Co. Tennessee: Crabtree. Texas: Waco (probably LeConte, 1875 locality, since this is where Belfrage lived the longest). West Virginia: Guthrie (CUIC, EGRC, FSCA, GHNC, ICCM, KSTC, MCTC, MCZC, NMDC, UAIC, USNM, WVDA).

***Zonantes mississippiensis*, new species**

*Diagnosis.* Body and elytra dark without markings, but differs from *Z. ater* in that the female has no brush on the first segment of the hind tarsi and has larger eyes (probably even larger in the unknown male). The 2 known specimens are slightly smaller, rich brown with paler appendages and a black head. Most *Z. ater* are brownish black with yellowish appendages. Separation of eyes 42%, length of antennae 128% of head width in female; male unknown. Length 2.24, width 1.11 mm, elytra 1.72 (1.72–1.76) mm long.

*Description.* Holotype, female: 2.24 mm long with head deflexed. Head 0.46 mm long to frontoclypeal suture, 0.69 wide across eyes, 0.57 behind; eyes 0.35 × 0.33 mm, separated by 0.17 and separated from hind margin by 0.06 (0.10 in a comparable *ater* female), a line across their hind margins 0.06 mm from middle of nearly truncate base of head; indented from front by 0.06 mm (by 0.11 mm in *ater* female). Setae at junction of facets rather long, 0.05 mm, and more conspicuous than usual. Head shiny, punctures distinct, 0.04 mm apart, setae subdecumbent, 0.07 mm. Antennae fairly short, 0.85 mm, gradually thicker to apex, where 0.09 mm wide. Prothorax 0.52 mm long, 0.56 wide across base, 0.65 maximum near middle, 0.38 at apex. Elytra 1.72 mm long, 0.89 wide across points of humeri, 1.11 maximum near middle; omoplates feebly developed; surface shiny, with punctures 0.04 mm apart, the intervals convex. Setae subdecumbent, 0.09 mm, tactile setae suberect, also 0.09.

*Specimens examined.* Holotype: female, labeled "Logtown, Hancock Co., Miss.,

VII-9-1965, collector H. R. Hepburn," from C. W. O'Brien, in USNM. Paratype: 1 female, labeled "Miss.: Hancock Co., I-10 rest area and Welcome Center, VI-17-82, E. G. Riley" (EGRC, USNM).

### *Elonus* Casey

*Elonus* Casey 1895:774 (type-species: *Xylophilus nebulosus* LeConte, new designation). Pic, 1905:235 (subgenus of *Hylophilus*). Baguena, 1948:27.

*Diagnosis.* Rather large species, with deep, flat-bottomed punctures, especially well developed on elytra, moderately long and erect setae and quite dense interstitial setae, directed laterally on elytra. Eyes deeply emarginate, with long, erect setae. Abdomen with a lateral zone of short, appressed golden pubescence on fused visible sterna 1 and 2 (true 3 and 4) in both sexes. In the male this continues onto the sterna behind and outlines a median zone which becomes an elevated plate starting on visible sternum 4. Male with antennal segment 11 elongate (Fig. 66), an apical spine on the front tibiae, and most species with a broad pad of plush-like "setae" on the hind femora (Figs. 47, 60, 61, 67, 68). Female with a dorsal pencil of golden setae on apex of hind tibiae (Fig. 53) and a small, seta-filled pit on middle of posterior portion of last visible abdominal sternum. Several additional species known from Mexico, Central America and Brazil.

### Key to Species

1. Elytra with pattern of brown and gray markings over whole surface, mainly in pubescence ..... *Elonus nebulosus*
- Cuticle of elytra dark with base reddish, rarely all reddish ..... 2
- 2(1). Separation of eyes ca. 15% of head width in male, 29% in female. Red zone at base of elytra sharply defined. Pubescence dark over dark part of elytra but gray along suture behind middle and in a slightly postmedian sublateral cloud in very fresh specimens, best seen in oblique light from front ..... *Elonus basalis*
- Separation of eyes ca. 27% of head width in male, 36% in female. Red zone at base of elytra poorly demarcated, rest of elytra and body not very dark in many individuals. Elytral pubescence uniform, setae and interstitial setae gray .... *Elonus hesperus*

### Basalis-Group

*Diagnosis.* Species in which the body is largely black, with the base of the elytra red (sometimes more extensively red). One undescribed species from the Southwest has simple hind femora in the male.

#### *Elonus basalis* (LeConte)

Figs. 45, 60, 66

*Xylophilus basalis* LeConte 1855:276. [Described from "Illinois, Mr. Willcox." Holotype, male, in LeConte Coll., MCZC, labeled "yellow disk / basalis 4," examined. The first specimen in the series is labeled "Type 4879," but it has appendages noted as missing in the original description.] LeConte, 1878:426. Casey, 1895:776 (*Elonus*).

*Elonus princeps* Casey 1895:775. [Holotype, female, labeled "W.H.H., Ottawa / Type USNM 36492," examined.] **New synonymy.**

*Diagnosis.* Measured specimen 2.93 mm long, 1.28 mm wide, elytra 2.30 (2.12–2.41) mm long. Separation of eyes 14%, length of antennae 238% of head width in male, 31% and 207% in female. In a male with hind femora 1.06 mm long, there is a basal excavation from 0.06 to 0.48 mm, 0.13 mm wide maximum; it is partly covered by a dense zone of 0.04 mm setae extending from front edge, and forms a narrow groove occupying at most  $\frac{1}{2}$  the width of the femur, parallel to trochanter and not divided by a transverse ridge. Male front tibiae almost straight, bowed by 0.04 mm; middle tibiae gently bowed, by 0.07 mm. Casey's *princeps* was based on a clean specimen with the gray elytral setae well developed.

*Distribution.* Florida to eastern Oklahoma, north to Quebec and Minnesota. USA: Arkansas: Fulton Co. District of Columbia: Florida: Devil's Millhopper State Park, Gainesville, Ocala, Torreya State Park. Illinois (LeConte, 1855), Coles Co. Indiana: Beverly Shores, Lake Station, Marion Co., Starke Co., Tippecanoe Co. Iowa: Boone. Kansas: Onaga, Topeka. Louisiana: Baton Rouge, Clinton. Maine: Augusta. Michigan: Midland. Minnesota: Durham. Mississippi: Oktibbeha Co. Missouri: Barry Co., Moberly, Vernon Co. New Hampshire: Carroll Co. (The Bowl & Wonalancet), Durham. New Jersey: Morristown. New York: Elbridge, Ithaca, Long Island (Lloyds Neck, Riverhead, Southold), Putnam, Schenectady. Ohio: Champaign Co., Delaware Co., Franklin Co., Greene Co., Hocking Co. Oklahoma: Latimer Co. Pennsylvania: Allegheny, Jeannette, Julian, West View. South Carolina: Florence. Virginia: Emporium. West Virginia: Junction. Canada: Ontario: Brittania, Chatterton, Hastings Co., Hillcrest, Osgoode, Ottawa (Casey, 1895, *princeps*), Prince Edward Co., Pelee Island, Point Pelee. Quebec: Hudson Mts., LaTrappe, King Mt. (CDAE, CNCI, CUI, CWOB, DENH, FMNH, FSCA, GHNC, ICCM, KSTC, MCTC, NMDC, OSUC, PSKC, SEMC, VMKC, UAIC, UMRM, USNM, WSCC, WVDA).

### ***Elonus hesperus*, new species**

Figs. 44, 47, 67

*Diagnosis.* Slightly smaller than *E. basalis* from the same locality in eastern Oklahoma, with whole base of elytra and scutellum rufescent, and pubescence uniformly pale over dark parts of elytra. Separation of eyes 28%, length of antennae 208% of head width in male, 34% and 197% in female. Length 2.71, width 0.98 mm, elytra 1.91 (1.90–2.12) mm long.

*Description.* Holotype, male: 2.71 mm long with head deflexed, dark brown, basal zone of elytra and scutellum rufescent. Head 0.47 mm long to frontoclypeal suture, 0.72 wide across eyes, 0.69 behind, 0.11 mm long behind eyes. Eyes  $0.38 \times 0.30$  mm, separated by 0.19. Antennae 1.57 mm long, last segment  $0.37 \times 0.13$ . Prothorax 0.67 mm long, 0.63 wide; elytra 1.91 mm long, 0.81 wide at points of distinct humeri, 0.98 maximum. Hind femora 0.87 mm long, with a weak basal excavation from 0.04 to 0.37, divided by a curved ridge 0.11 from base in front  $\frac{1}{3}$ , 0.15 at middle, 0.22 at hind margin; maximum width of excavation ca. 0.13 mm of 0.24 across femur but excavation weak in front; posterior portion with sparse setae and appearing somewhat like the narrow excavation of male *basalis*, which has no transverse ridge; anterior portion with dense setae but these not forming a sharp border. Front tibiae

weakly bowed, by 0.06 mm, middle tibiae more distinctly, by 0.09 mm. Paratype: female, head 0.47 mm long, 0.72 wide and 0.15 long behind eyes, which are  $0.37 \times 0.27$  mm and separated by 0.26. Antennae 1.37 mm long, segment 11  $0.26 \times 0.15$ . Apex of hind tibiae with a firm dorsal pencil of golden setae, 0.13 mm long, 0.04 thick at base and tapering to a fine point. There is little variation in the Oklahoma specimens, except for the extent of rufescent coloration, which sometimes predominates.

*Specimens examined.* Eastern Oklahoma, Missouri and a disjunct population that is slightly different in eastern Arizona. Holotype, male, labeled "Oklahoma: Latimer Co., -VIII-83, Karl Stephan / in blacklight trap," in USNM. Paratypes: 29 males in blacklight trap, 1 female, same locality, collecting method not recorded. 2 males, Oklahoma: Marshall Co., UOBS, Willis, at light, W. R. Suter. 1 male, Missouri, Jackson Co., Raytown, at light, G. H. Nelson. 1 male, Missouri, Barry Co., 3 mi SW Roaring River State Park, E. G. Riley. Apparently nocturnal, the males having been taken mainly or entirely at light (FMNH, FSCA, GHNC, LSUC, UAIC, USNM).

Associated with these, but not designated as paratypes, are some eastern Arizona specimens, all probably taken at light. These are all males with legs like the holotype but whole aspect generally darker than the Oklahoma series and with the eyes slightly larger and more narrowly separated (by 22% of head width vs. 27% in Oklahoma). Arizona: Greenlee Co.: 21 mi N Clifton; Yavapai Co.: Cherry; Pima Co.: Sta. Catalina Mts.: Molino Basin and Sabino Canyon (CNCI, UAIC).

#### Nebulosus-Group

*Diagnosis.* Species in which the elytra are not red at the base, but have a strong brown and gray color pattern. Several species in Mexico in addition to one in the U.S.A.

#### *Elonus nebulosus* (LeConte)

Figs. 43, 53, 61, 68, 70

*Xylophilus nebulosus* LeConte, 1875:175. [Described from "Pennsylvania, Louisiana." Lectotype, new designation, male, in LeConte Coll., MCZC, labeled "Pen., on pale blue paper / X. nebulosus Lec. / Type 4880," examined. This designation restricts the type-locality to Pennsylvania.] Casey, 1895:776 (*Elonus*).

*Diagnosis.* Brown, interstitial setae the main ones involved in a distinct brown and gray pattern on elytra, pale setae overlying pale cuticle. Separation of eyes 14%, length of antennae 286% of head width in male, 34% and 223% in female. Length 2.45, width 1.02 mm, elytra 1.94 (1.65–2.01) mm long.

Plush zone of male hind femora with a large and strong excavation in basal portion; in a male with hind femur 0.83 mm long the excavation extends from 0.06 to 0.28 mm in front, 0.34 behind; it is margined narrowly in front but almost flat behind; its pubescence fine, nearly erect, directed obliquely posteriorly.

*Distribution.* Florida to eastern Oklahoma, north to Quebec and Michigan. U.S.A.: Alabama: Birmingham, Helena, Sheffield. Arkansas: Jasper. Florida: Gainesville, Paynes Prairie, Torreya State Park. Indiana: Marion Co., Tippecanoe Co. Iowa: Ames. Louisiana: Baton Rouge, Feliciana Parish, Jackson. Maine: Casco. Maryland:

Great Falls of Potomac River. Michigan: Charlevoix Lake. Missouri: Boone Co., Columbia, Jackson Co., Moberly, Mound City, St. Francois Co. Nebraska: Litchfield. New York: Elbridge, Marlboro. Ohio: Ashland Co., Cincinnati, Delaware Co., Fairfield Co., Greene Co., Hocking Co., Putnam Co., Scioto Co. Oklahoma: Latimer Co. Pennsylvania: Allegheny, Jeannette, Pittsburg. South Carolina: Florence. Virginia: Mt. Vernon. West Virginia: Boyer, Guthrie. Canada: Ontario: Arnprior, Ottawa, Prince Edward Co. Quebec: Old Chelsea (CNCI, CUIC, DENH, EGRC, FMNH, FSCA, GHNC, ICCM, KSTC, LSUC, MCZC, NMDC, OSUC, PSKC, SEMC, UAIC, UMRM, USNM, VMKC, WSCC, WVDA).

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